

**OBSERVATIONS AND CALIRATIONS OF DMSP F15 SSM DATA
DECEMBER 1999 – OCTOBER 2000**

**Neil I. Miller
L. Ethan Sexton**

**Radex Incorporated
Three Preston Court
Bedford, MA 01730-3010**

10 January 2001

Scientific Report No. 8

20040112 150

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED



**AIR FORCE RESEARCH LABORATORY
Space Vehicles Directorate
29 Randolph Rd
AIR FORCE MATERIEL COMMAND
Hanscom AFB, MA 01731-3010**

This technical report has been reviewed and is approved for publication.

/Signed/
ALAN REBELLO
Contract Manager

/Signed/
ROBERT MORRIS
Branch Chief

This document has been reviewed by the ESC Public Affairs Office and has been approved for release to the National Technical Information Service (NTIS).

Qualified requestors may obtain additional copies from the Defense Technical Information Center (DTIC). All others should apply to the NTIS.

If your address has changed, if you wish to be removed from the mailing list, or if the addressee is no longer employed by your organization, please notify AFRL/VSIM, 29 Randolph Rd., Hanscom AFB, MA 01731-3010. This will assist us in maintaining a current mailing list.

Do not return copies of this report unless contractual obligations or notices on a specific document require that it be returned.

| REPORT DOCUMENTATION PAGE | | | Form Approved OMB No. 0704-0188 | |
|--|--|---|---|--|
| Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. | | | | |
| 1. AGENCY USE ONLY (Leave Blank) | 2. REPORT DATE 10 January 2001 | 3. REPORT TYPE AND DATES COVERED Scientific Report No. 8 | | |
| 4. TITLE AND SUBTITLE Observations and Calibrations of DMSP F15 SSM Data December 1999 – October 2000 | | 5. FUNDING NUMBERS PE 62101F PR 7659 TA GY WU AG Contract F19628-98-C-0054 | | |
| 6. AUTHORS Neil I. Miller L. Ethan Sexton | | | | |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Radex, Inc. Three Preston Court Bedford, MA 01730 | | 8. PERFORMING ORGANIZATION REPORT NUMBER RXR-030601 | | |
| 9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) Air Force Research Laboratory 29 Randolph Road Hanscom AFB, MA 01731-3010 Contract Manager: Alan Rebello/VS BX | | 10. SPONSORING / MONITORING AGENCY REPORT NUMBER AFRL-VS-TR-2003-1576 | | |
| 11. SUPPLEMENTARY NOTES | | | | |
| 12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release. Distribution Unlimited. | | 12b. DISTRIBUTION CODE | | |
| 13. ABSTRACT (Maximum 200 words) This report relates the precise calibration study and other observations of data from the Special Sensor Magnetometer (SSM) mounted on a boom aboard the sun-synchronous, polar-orbiting F15 satellite of the Defense Meteorological Satellite Program (DMSP) at about 850Km altitude. Data was surveyed for the period from launch in December 1999 until October 2000. The efforts described concentrated upon discerning a more precise in-flight calibration of the SSM instrument, examining the precision of that calibration, noting any unusual phenomena measured by the instrument, and searching for any artifacts caused by the mounting of the sensor upon a 5m boom instead of the upon the body of the spacecraft. Calibration methods, the resulting calibration, and the accuracy of those calibrations are described. Features of the measured ionospheric magnetic field after calibration are illustrated, and attempts are made to attribute those errors to particular sources. The magnetic field impact and mathematical behavior of potential boom-induced artifacts are analyzed and compared to the observed data. The presence, absence, and removal of such features is discussed. | | | | |
| 14. SUBJECT TERMS DMSP F15, Special sensor magnetometer (SSM), Satellite-based magnetometer, Boom-mounted magnetometer, Calibration, Ionospheric magnetic field, Interference | | | 15. NUMBER OF PAGES | |
| | | | 16. PRICE CODE | |
| 17. SECURITY CLASSIFICATION OF REPORT Unclassified | 18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified | 19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified | 20. LIMITATION OF ABSTRACT Unlimited | |

TABLE OF CONTENTS

| | | |
|-------|---|----|
| 1. | INTRODUCTION | 1 |
| 2. | IN-FLIGHT CALIBRATION | 2 |
| 2.1 | Form Of The Calibration | 2 |
| 2.2 | Method Of Determining The Calibration | 3 |
| 2.3 | Potential Effects Of Various Errors | 3 |
| 2.3.1 | Instrument Precision | 3 |
| 2.3.2 | Geomagnetic Model Field Drift | 3 |
| 2.3.3 | Potential Ephemeris Errors | 5 |
| 2.3.4 | Potential Time Error | 7 |
| 2.3.5 | Clipping | 8 |
| 2.3.6 | Accuracy of the Calibration Process for One Day of Data | 11 |
| 2.3.7 | Other Potential Sources of Calibration Error | 13 |
| 2.4 | Preliminary Calibration Matrices | 13 |
| 2.4.1 | Preliminary Late Calibration Matrices | 13 |
| 2.4.2 | Preliminary Early Calibration Matrices | 14 |
| 2.4.3 | Preliminary Late Versus Preliminary Early Calibration Matrices | 14 |
| 2.5 | Final Early Calibration | 15 |
| 2.6 | Final Late Calibration | 15 |
| 2.7 | Differences Between Early And Late Final Calibrations | 16 |
| 2.8 | Switchover Date From Early Calibration To Later Calibration | 17 |
| 2.9 | Precision Of The Calibration | 19 |
| 2.10 | An Attempt To Calculate Calibration Drift | 21 |
| 3. | OBSERVED PHENOMENA | 24 |
| 3.1 | Appearance Of Calibrated Data | 24 |
| 3.2 | Remaining Equipment Operation Induced Step Field Jumps | 28 |
| 3.3 | Sinusoid In The Orbit Normal (Z) Dimension | 29 |
| 3.3.1 | Most Wavy-Flat Boundaries Are Sudden | 29 |
| 3.3.2 | Relationship Between Z And X/Y | 31 |
| 3.3.3 | X And Y Waves Are Not Created By Calibration | 32 |
| 3.4 | Sawtooth In The Down (X) Dimension | 33 |
| 3.4.1 | Height Of The X-Sawtooth Phenomena | 34 |
| 3.4.2 | Period Of The X-Sawtooth Phenomena | 34 |
| 3.4.3 | Latitudinal Distribution Of The X-Sawtooth Phenomena | 35 |
| 3.4.4 | Sawteeth Cross Day And File Boundaries | 35 |
| 3.4.5 | Sawteeth In The Z-Curve, But Not The Y-Curve | 36 |
| 3.5 | Time-Phase Calibration Study | 37 |
| 3.5.1 | Method | 38 |
| 3.5.2 | Results | 38 |
| 3.5.3 | Conclusions | 43 |
| 3.6 | Igrf Versus Ørsted Coefficients | 43 |
| 3.6.1 | Method | 43 |
| 3.6.2 | Results | 44 |
| 3.6.3 | The Effect of dB/dt Coefficients | 45 |
| 3.6.4 | Calibration-Correction Matrices for Ørsted vs. IGRF 2000 Models | 46 |
| 4. | THE SEARCH FOR BOOM-RELATED ARTIFACTS | 47 |
| 4.1 | Purpose Of The Boom | 48 |
| 4.2 | Potential Problem With The Boom | 48 |

| | | |
|---------|--|----|
| 4.3 | Simulating Boom Oscillation..... | 48 |
| 4.3.1 | Simulation And Effects Of A Continual Orientation Error | 49 |
| 4.3.2 | Simulation And Effects Of A Varying Orientation Error | 49 |
| 4.3.3 | Simulation And Effects Of A Damped Impulse Error | 50 |
| 4.4 | Model Used To Produce The Simulation Data Plots..... | 50 |
| 4.4.1 | The Model Equation..... | 50 |
| 4.4.2 | Algorithms That Simulate The Twist Types | 51 |
| 4.4.2.1 | Continual Twist | 52 |
| 4.4.2.2 | Thermal Twist..... | 52 |
| 4.4.2.3 | Impulse Twist..... | 52 |
| 4.4.3 | Jump Removal | 52 |
| 4.5 | Rules Of The Analysis Of Boom Effects | 53 |
| 4.5.1 | Sample Data Used | 53 |
| 4.5.2 | Why Body-Mounted And Boom-Mounted Ssm Data Can Not Be Compared | 53 |
| 4.5.3 | Definition Of The Boom Effect..... | 54 |
| 4.5.4 | The Output Mfr File..... | 55 |
| 4.5.5 | Calibration Independence..... | 55 |
| 4.6 | Confirming The Results Of The Boom Simulation Study | 55 |
| 4.6.1 | Method Used To Produce The Data Plots | 55 |
| 4.6.2 | Results..... | 56 |
| 4.6.2.1 | Effects Of Different Twist Types..... | 56 |
| 4.6.2.2 | Two Dimensions Versus Three (Continual Twist) | 66 |
| 4.6.2.3 | 1.5 Degrees Versus 2.5 Degrees (Impulse Twist) | 66 |
| 4.6.3 | Summary Of Results Of Preliminary Simulation..... | 66 |
| 4.7 | Filling In The Gaps: Effects Of Dimensions Of Continual Twist..... | 67 |
| 4.7.1 | The Compared Plots..... | 67 |
| 4.7.2 | Results..... | 67 |
| 4.8 | How The Factors Influence The Measured Field..... | 69 |
| 4.8.1 | Selection Of Factors..... | 69 |
| 4.8.2 | Observed Results | 70 |
| 4.8.2.1 | Day Of Year | 70 |
| 4.8.2.2 | Time Of Day..... | 71 |
| 4.8.2.3 | Continual-Twist Angle A..... | 71 |
| 4.8.2.4 | Continual-Twist Angle B..... | 71 |
| 4.8.2.5 | Continual-Twist Angle C..... | 71 |
| 4.8.2.6 | Maximum Heat-Induced Angle | 71 |
| 4.8.2.7 | Maximum Impulse Angle..... | 71 |
| 4.8.2.8 | Damping Time | 72 |
| 4.8.2.9 | Duration Of Applied Impulse..... | 72 |
| 4.8.3 | Summary Of Results Of Factor Analysis | 72 |
| 4.8.4 | Proofs Of Results Of Factor Analysis | 73 |
| 4.8.4.1 | Proof Of Linearity Between Continual-Twist Angles And Curve Amplitudes | 73 |
| 4.8.4.2 | Proof Of Linearity Between Thermal-Twist Angle And Curve Amplitudes | 75 |
| 4.8.4.3 | Proof Of Linearity Between Impulse Angle And Spike Heights..... | 76 |
| 4.8.4.4 | Proof Of Statements About Damping Time Of Impulse | 77 |
| 4.9 | Decomposing The Boom Effect..... | 80 |
| 4.9.1 | Mathematical Decomposition of the Baseline Curves | 81 |
| 4.9.1.1 | The Least-Squares Equation | 81 |
| 4.9.1.2 | Field Versus Time..... | 82 |
| 4.9.1.3 | Field Versus Altitude..... | 86 |
| 4.9.1.4 | Field Versus Latitude | 87 |

| | | |
|-------------|---|-----|
| 4.9.1.5 | <i>Field Versus Sunlight</i> | 89 |
| 4.9.1.6 | <i>Fourier Transform of Field Versus Time Frequency</i> | 91 |
| 4.9.1.7 | <i>Overall Composition of W According to the Above Least-Squares Method</i> | 98 |
| 4.9.2 | Inspection of the Graphs | 101 |
| 4.9.2.1 | <i>Plots of Field Versus Time</i> | 101 |
| 4.9.2.2 | <i>Plots of Field Versus Altitude</i> | 105 |
| 4.9.2.3 | <i>Plots of Field Versus Latitude</i> | 105 |
| 4.9.2.4 | <i>Plots of Field Versus Sunlight</i> | 105 |
| 4.9.2.5 | <i>Plots of Fourier Transform of Field Versus the Frequency Domains</i> | 105 |
| 4.9.2.6 | <i>Misidentification of Noise</i> | 109 |
| 4.9.2.7 | <i>Misidentification of Natural Phenomena</i> | 110 |
| 4.9.2.7.1 | <i>Artifacts</i> | 111 |
| 4.9.2.7.2 | <i>Impulse Spikes in Auroral Regions</i> | 112 |
| 4.9.2.7.3 | <i>Which Artifacts are Actual Twists?</i> | 112 |
| 4.9.3 | Summary of Decomposition Analysis | 112 |
| 4.9.3.1 | <i>Least-Squares Results</i> | 112 |
| 4.9.3.1.1 | <i>Decomposition of a Small Amount of the Baseline Curve</i> | 113 |
| 4.9.3.1.2 | <i>Overall Makeup of the Baseline Curve</i> | 113 |
| 4.9.3.2 | <i>Visual Inspection</i> | 113 |
| 4.9.3.2.1 | <i>Results</i> | 114 |
| 4.9.3.2.2 | <i>Confusion of Boom Twists with Noise and Natural Sources</i> | 114 |
| 4.10 | Summary Of Boom-Artifact Experiment | 115 |
| 4.10.1 | <i>The Results of the Preliminary Simulation</i> | 115 |
| 4.10.2 | <i>Order of Importance of Twist Types and Other Factors</i> | 116 |
| 4.10.3 | <i>Other Observations</i> | 116 |
| 4.10.4 | <i>Decomposing the Baseline into Twist Types</i> | 117 |
| 4.10.4.1 | <i>Confusion of Boom Twists with Noise and Natural Sources</i> | 118 |
| 4.10.5 | <i>Epilogue</i> | 118 |
| 5. | SUMMARY | 119 |
| | REFERENCES | 121 |
| APPENDIX A. | EARLY CALIBRATION DATA QUALITY RESULTS | 123 |
| APPENDIX B. | LATE CALIBRATION DAILY RESULTS | 129 |
| APPENDIX C. | DIFFERENCING OF EARLY AND LATE CALIBRATION RESULTS | 135 |
| APPENDIX D. | LATE CALIBRATION ORBITAL RESULTS FOR ALL DATA | 141 |
| APPENDIX E. | LATE CALIBRATION ORBITAL RESULTS FOR NON-AURORAL DATA | 205 |
| APPENDIX F. | FILES CONTAINING FRAME TIME ABNORMALITIES | 269 |
| APPENDIX G. | DMSP ORBITAL ELEMENT VALIDATION | 271 |
| APPENDIX H. | ADDITIONAL BOOM STUDY PLOTS | 279 |
| APPENDIX I. | GLOSSARY OR TERMINOLOGY | 297 |

LIST OF FIGURES

| | | |
|-------------------|--|-----|
| Figure 1. | Change in Geomagnetic Model Field From IGRF95 to IGRF2000. | 4 |
| Figure 2. | Effect Upon Model Geomagnetic Field of a +/-4Km Eccentricity Error. | 6 |
| Figure 3. | Effect of a 1.0 Second Phase Error on the Model Geomagnetic Field. | 8 |
| Figure 4. | Difference Between Clipped Calibration and Optimal Calibration. | 10 |
| Figure 5. | Difference Between Unclipped and Optimal Calibration. | 11 |
| Figure 6. | Difference Between Final Early and Late Calibrations. | 16 |
| Figure 7. | Determining Preferred Calibration for Each Day for All Axes. | 18 |
| Figure 8. | Precision of the Calibration for Each Low Ap Day. | 20 |
| Figure 9. | Quiet day Calibrated Measured-Minus-Modeled Data. | 25 |
| Figure 10. | Active Day Calibrated Measured-Minus-Modeled Data. | 26 |
| Figure 11. | Remaining Difference in the Measured-Minus-Modeled Field. | 27 |
| Figure 12. | Remaining Equipment Operation Induced Step Field Jumps. | 28 |
| Figure 13. | The Z-Wave Crossing Midnight. | 31 |
| Figure 14. | The X Sawtooth. | 34 |
| Figure 15. | Some Sawteeth in the Z Curve. | 36 |
| Figure 16. | Y-Curve Without Corrective Time-Phase Shift. | 40 |
| Figure 17. | Y Curve with Best Corrective Time-Phase Shift. | 41 |
| Figure 18. | Difference Between Ørsted and IGRF2000 Geomagnetic Field Models. | 44 |
| Figure 19. | Comparison of Calibrated Measured-Minus-Modeled Fields: Ørsted vs. IGRF 2000. | 45 |
| Figure 20. | Effect of Earth's Axial Tilt on Day/Night Terminator at Altitude. | 49 |
| Figure 21. | Baseline curve, Day 357-1999, 00:00-04:00 UT (Figure A.1 in Appendix APPENDIX H). | 57 |
| Figure 22. | Occurrence of Phenomena in Baseline Curves. | 58 |
| Figure 23. | Continual Twist, (A,B,C) = (1,0,1), Day 357-1999, 00:00-04:00 UT. (Figure A.2 in Appendix APPENDIX H) | 59 |
| Figure 24. | Occurrence of Peaks and Troughs in One Orbit for the Continual Twist Case. | 60 |
| Figure 25. | Thermal Twist, Maximum Angle = 2.5 Degrees, Day 357-1999, 00:00-04:00 UT. (Figure A.4 in Appendix APPENDIX H). | 61 |
| Figure 26. | Occurrence of Peaks and Troughs in One Orbit For the Thermal Twist Case. | 62 |
| Figure 27. | Impulse Twist, Maximum Angle = 2.5 Degrees, Day 357-1999, 00:00-04:00 UT. (Figure A.6 in Appendix APPENDIX H). | 63 |
| Figure 28. | Occurrence of Spikes Due for One Orbit in the Impulse Case. | 64 |
| Figure 29. | Combination of Continual, Thermal, and Impulse Twists, Day 357-1999, 00:00-04:00 UT. (Figure A.7 in Appendix APPENDIX H). | 65 |
| Figure 30. | Comparing the Curve of the Increase Factor vs. N with the Straight Line of N vs. N. | 79 |
| Figure 31. | Effect of Damping Time on Impulse Spike Duration. | 80 |
| Figure 32. | Usefulness of the Fourier Transform (I). | 92 |
| Figure 33. | Usefulness of the Fourier Transform (II). | 93 |
| Figure 34. | Usefulness of the Fourier Transform (III). | 94 |
| Figure 35. | Usefulness of the Fourier Transform (IV). | 94 |
| Figure 36. | Baseline Curve, Field Versus Time, All 24 Hours of Day 050-2000. (Figure A.12 in Appendix APPENDIX H). | 102 |
| Figure 37. | Thermal Twist, Field Versus Time, All 24 Hours of Day 050-2000. (Figure A.13 in Appendix APPENDIX H). | 103 |
| Figure 38. | Impulse Twist, Field Versus Time, All 24 Hours of Day 050-2000. (Figure A.14 in Appendix APPENDIX H). | 104 |

| | |
|--|-----|
| Figure 39. Baseline Curve, FT of Field Versus Time, X-axis, All 24 Hours of Day 050-2000, with Only Field Values Between -10000 and 10000 (Figure A.15 in Appendix APPENDIX H)..... | 107 |
| Figure 40. Thermal Twist, FT of Field Versus Time, X-axis, All 24 Hours of Day 050-2000, with Only Field Values Between -10000 and 10000 (Figure A.16 in Appendix APPENDIX H)..... | 108 |
| Figure 41. Original document Figure number 1..... | 274 |
| Figure 42. Original document Figure number 2..... | 274 |
| Figure 43. Original document Figure number 3..... | 275 |
| Figure 44. Original document Figure number 4..... | 275 |
| Figure 45. Original document Figure number 5..... | 276 |
| Figure 46. Original document Figure number 6..... | 276 |
| Figure 47. Original document Figure number 7..... | 277 |
| Figure 48. Baseline curve, Day 1999-357, 00:00-04:00 UT. Referred to in..... | 280 |
| Sections 4.6.1, 4.6.2.1 and 4.8.2.1..... | 280 |
| Figure 49. Continual twist, (A,B,C) = (1,0,1) Day 1999-357, 00:00-04:00 UT. | 281 |
| See Sections 4.6.1, 4.6.2.1, 4.6.2.2, and 4.7.2. | 281 |
| Figure 50. Continual twist, (A,B,C) = (1,1,-1), Day 1999-357, 00:00-04:00 UT. | 282 |
| See Sections 4.6.1, 4.6.2.2 and 4.7.2. | 282 |
| Figure 51. Thermal twist, maximum angle = 2.5 degrees, Day 1999-357, 00:00-04:00 UT. | 283 |
| See Sections 4.6.1 and 4.6.2.1. | 283 |
| Figure 52. Impulse twist, maximum angle = 1.5 degrees, Day 1999-357, 00:00-04:00 UT..... | 284 |
| See Sections 4.6.1 and 4.6.2.3. | 284 |
| Figure 53. Impulse twist, maximum angle = 2.5 degrees, Day 1999-357, 00:00-04:00 UT..... | 285 |
| See Sections 4.6.1, 4.6.2.1 and 4.6.2.3. | 285 |
| Figure 54. Combination of continual, thermal, and impulse twists, Day 1999-357, 00:00-04:00 UT. See Sections 4.6.1 and 4.6.2.1. | 286 |
| Figure 55. Continual twist, (A,B,C) = (1,1,1), Day 1999-357, 00:00-04:00 UT. | 287 |
| See Sections 4.7.1 and 4.7.2. | 287 |
| Figure 56. Continual twist, (A,B,C) = (1,0,0), Day 1999-357, 00:00-04:00 UT. | 288 |
| See Sections 4.7.1 and 4.7.2. | 288 |
| Figure 57. Continual twist, (A,B,C) = (0,1,0), Day 1999-357, 00:00-04:00 UT. | 289 |
| See Sections 4.7.1 and 4.7.2. | 289 |
| Figure 58. Continual twist, (A,B,C) = (0,0,1), Day 1999-357, 00:00-04:00 UT. | 290 |
| See Sections 4.7.1 and 4.7.2. | 290 |
| Figure 59. Baseline curve, field versus time, all 24 hours of Day 2000-050. See Section 4.9.2.1. | 291 |
| Figure 60. Thermal twist, field versus time, all 24 hours of Day 2000-050. See Section 4.9.2.1..... | 292 |
| Figure 61. Impulse twist, field versus time, all 24 hours of Day 2000-050. See Section 4.9.2.1. | 293 |
| Figure 62. Baseline curve, FT of field vs. time, X-axis, all 24 hours of Day 2000-050, with only field values between -10000 and 10000. See Section 4.9.2.5..... | 294 |
| Figure 63. Thermal twist, FT of field vs. time, X-axis, all 24 hours of Day 2000-050, with only field values between -10000 and 10000. See Section 4.9.2.5..... | 295 |

LIST OF TABLES

| | | |
|------------------|--|----|
| Table 1. | Precision of the Calibration. | 19 |
| Table 2. | A Study of Change in Calibration Rotation Angles..... | 23 |
| Table 3. | Transition Behavior of the Z-Wave Across Day/File Boundaries..... | 30 |
| Table 4. | Comparative Wave Amplitudes in Z vs. X & Y..... | 32 |
| Table 5. | Latitudinal Distribution of the X-Sawtooth.. | 35 |
| Table 6. | Results of Attempted Correction of Hypothetical Time-Phase Error..... | 39 |
| Table 7. | Best Corrective Time-Phase Shifts for Various Days and Dimensions..... | 42 |
| Table 8. | Comparison of Best Corrective Time-Phase Shifts. | 42 |
| Table 9. | Affect of Different Calibrations Derived From Ørsted vs. IGRF 2000 Models..... | 47 |
| Table 10. | Table of Plots. | 56 |
| Table 11. | Comparison of the Six Cases. | 68 |
| Table 12. | Coefficients of Components of the Baseline Curve as a Function of Time..... | 83 |
| Table 13. | Maximum Contributions of Components of the Baseline Curve as a Function of Time. | 84 |
| Table 14. | Average Contributions of Components of the Baseline Curve as a Function of Time..... | 85 |
| Table 15. | Coefficients of Components of the Baseline Curve as a Function of Altitude..... | 86 |
| Table 16. | Maximum Contributions of Components of the Baseline Curve as a Function of Altitude..... | 86 |
| Table 17. | Average Contributions of Components of the Baseline Curve as a Function of Altitude..... | 87 |
| Table 18. | Coefficients of Components of the Baseline Curve as a Function of Latitude..... | 88 |
| Table 19. | Maximum Contributions of Components of the Baseline Curve as a Function of Latitude..... | 88 |
| Table 20. | Average Contributions of Components of the Baseline Curve as a Function of Latitude..... | 89 |
| Table 21. | Coefficients of Components of the Baseline Curve as a Function of Sunlight. | 90 |
| Table 22. | Maximum Contributions of Baseline Curve Components as a Function of Sunlight..... | 90 |
| Table 23. | Average Contributions of Baseline Curve Components as a Function of Sunlight.. | 91 |
| Table 24. | Real FFT-Derived Coefficients of Baseline Curve Components as a Function of Time. | 95 |
| Table 25. | Imaginary FFT-Derived Coefficients of Baseline Curve Components as a Function of Time. | 95 |
| Table 26. | Real FFT-Derived Maximum Contributions of Baseline Curve Components as a Function of Time. | 96 |
| Table 27. | Imaginary FFT-Derived Maximum Contributions of Baseline Curve Components as a Function of Time..... | 96 |

| | | |
|------------------|--|-----|
| Table 28. | Real FFT-Derived Average Contributions of Baseline Curve Components as a Function of Time. | 97 |
| Table 29. | Imaginary FFT-Derived Average Contributions of Baseline Curve Components as a Function of Time..... | 98 |
| Table 30. | Summary of Primary Twist Components by Angle..... | 99 |
| Table 31. | Summary of Primary Twist Components by Maximum Field Strength. | 100 |
| Table 32. | Summary of Primary Twist Components by Average Field Strength. | 100 |

Acknowledgements

The authors would like to thank Dr. Frederick Rich of AFRL/VSBX for his generous support as the AFRL SSM Principal Investigator, Nelson Bonito of Radex, for his guidance and suggestions of avenues of investigation, and Carolyn Parsons and associates of Boston College at AFRL, who archive DMSP Special Sensor Data for AFRL, without which data none of the work described in this report would have been possible.

1. INTRODUCTION

The purpose of this report is to relate the precise calibration study and other observations of the DMSP F15 SSM data since the brief initial examination and calibration related in the "Summary of Efforts Relating to Calibration of the Special Sensor Magnetometer Aboard DMSP F15" report of March 1, 2000. Efforts since that date have concentrated upon attempting to discern a more precise calibration, examine the precision of that calibration, to note any unusual phenomena observed in the data, and to search for any artifacts in the data conceivably caused by the mounting of the sensor upon a 5m boom.

The placement of the sensor on the boom is the major driver of this investigation. Locating the SSM away from the body of the spacecraft should drastically reduce the affect of spacecraft magnetic fields upon the field at the sensor, thereby allowing more accurate measurements. However, with the boom comes the question of whether the mechanics of the boom impact the measurements.

All analyses have been performed using ephemeris generated from Two Line Element sets (TLEs) unless noted otherwise. All source SSM data has consisted of "Boston College" format data files obtained by AFRL. These files contain one day of SSM data from F15, starting at 0000UT. Unless specifically stated otherwise, only data from days 2000-005 through 2000-305 were used.

DMSP F15 has an orbital period of about 6120 seconds, or 14.12 orbits per day. Its sun-synchronous, very low eccentricity polar orbit has an altitude of about 850km. Approximate Local Time of the ascending and descending nodes is 2124UT and 0924UT, respectively.

Contact Information:

Neil Miller, an employee of Radex, Inc., is one of the authors of this report.
3 Preston Court, Bedford, MA 01730.
Phone: (781)-275-6767 email: miller@radex.com

Ethan Sexton, an employee of Radex, Inc., is one of the authors of this report.
Bldg. 1102F, Room 364,
U.S. Air Force Laboratory Space Weather Center of Excellence (AFRL-VSBX),
Hanscom AFB, MA.
Phone: (781)-377-4168 email: sexton@gpd.plh.af.mil

Michael Kendra, an employee of Radex, Inc., wrote the report contained in APPENDIX G.
3 Preston Court, Bedford, MA 01730.
Phone: (781)-275-6767 email: kendra@radex.com

Dr. Frederick Rich is the AFRL researcher for SSM.
 Bldg. 1102F, Room 149,
 U.S. Air Force Laboratory Space Weather Center of Excellence (AFRL-VSBXP),
 Hanscom AFB, MA.
 Phone: (781)-377-3857 email: Frederick.Rich@hanscom.af.mil

Radex, Inc.
 3 Preston Court, Bedford, MA 01730.
 Phone: (781)-275-6767 web: www.radex.com

2. IN-FLIGHT CALIBRATION

Before launch, the SSM sensor is calibrated to determine the relationship between measurements in counts and real engineering values. After an SSM-bearing DMSP satellite is launched, an in-flight calibration is performed. This calibration corrects for cross-talk amongst the three magnetometers and for any constant offsets to the field caused by spacecraft-ambient magnetic fields. Anywhere within this document a calibration is referred to, it is the in-flight calibration unless explicitly stated otherwise.

2.1 Form Of The Calibration

For a measured magnetic field vector $[B_x \ B_y \ B_z]$ in NanoTesla, the ORTHO and OFFSET matrices are applied to generate the calibrated measured magnetic field vector B .

$[B_{true}] = [ORTHO] * [B] + [OFFSET]$; that is,

$$\begin{bmatrix} B_{x_true} \\ B_{y_true} \\ B_{z_true} \end{bmatrix} = \begin{bmatrix} ORTHO_{11} & ORTHO_{12} & ORTHO_{13} \\ ORTHO_{21} & ORTHO_{22} & ORTHO_{23} \\ ORTHO_{31} & ORTHO_{32} & ORTHO_{33} \end{bmatrix} \begin{bmatrix} B_x \\ B_y \\ B_z \end{bmatrix} + \begin{bmatrix} OFFSET_x \\ OFFSET_y \\ OFFSET_z \end{bmatrix}, \text{ where :} \quad (1)$$

$[B_{true}]$ = the calibrated magnetic field,
 $[B]$ = the measured magnetic field before calibration, and
 $[ORTHO]$ and $[OFFSET]$ are the calibration matrices
 where X is down, Y is in the direction of motion, and Z is in the direction of the satellite orbit normal.

It should be noted that while this calibration can correct constant gain errors and account for contributions from all three magnetometers in each dimension for field measurements of various magnitudes, it cannot correct for time-dependent errors.

2.2 Method Of Determining The Calibration

The calibration is determined by performing a least squares fit of the measured data for a period of low ionospheric magnetic activity to the latest available IGRF geomagnetic model, in this case IGRF 2000 to the 11th order. While this calibration is based on the assumption that for a “quiet” period of low magnetic activity the measured field should equal the modeled field, a further precautionary step is taken: those periods of data when the instrument is expected or graphically observed to have measured activity in the auroral regions are “clipped” or not considered for the fitting, as described in Section 2.3.5. Finally, data from multiple orbits is used in an effort to dampen the affects of any orbit-dependent inaccuracies.

2.3 Potential Effects Of Various Errors

The first step in studying the precision of the SSM in-flight calibration is an understanding of what error is present in that calibration.

2.3.1 Instrument Precision

The precision of the SSM instrument measurements is the absolute limit on the precision of any analysis of the SSM data. SSM measurements consist of a fine measurement and a range measurement. A one-bit change in the fine measurement equates to 2 nanoTesla, which for the entire 12 bits equates to the range measurement precision of approximately 4100nT per bit. Due to this limit, most results below are presented only to the nearest nT as anything more precise would be nonsensical. Note that this describes only the precision, or how fine a measurement the instrument is capable of, not the accuracy, which is whether the instrument will produce the same measurements from the same data repeatedly.

2.3.2 Geomagnetic Model Field Drift

The basic premise of the SSM in-flight calibration process is that under ideal circumstances, the field measured by the SSM is equal to the geomagnetic field plus the ionospheric magnetic field. When the ionospheric field can be neglected, the measured field ideally is equal to the geomagnetic field, which is modeled using IGRF coefficients. However, the IGRF model is issued every 5 years, with coefficients for the field at the epoch of issue and for the rate of change of the model field over time. The difference between the field calculated from the IGRF 1995 coefficients and one calculated from the IGRF 2000 coefficients on a day near January 1, 2000 is an estimate of the magnitude of the error in the model field due to time distance from the epoch of the coefficients.

For Day 2000-006, this difference had a range of:

X: -200 to 190nT

Y: -170 to 160nT

Z: -150 to 130nT

Total Magnitude of difference: 0 to 210nT.

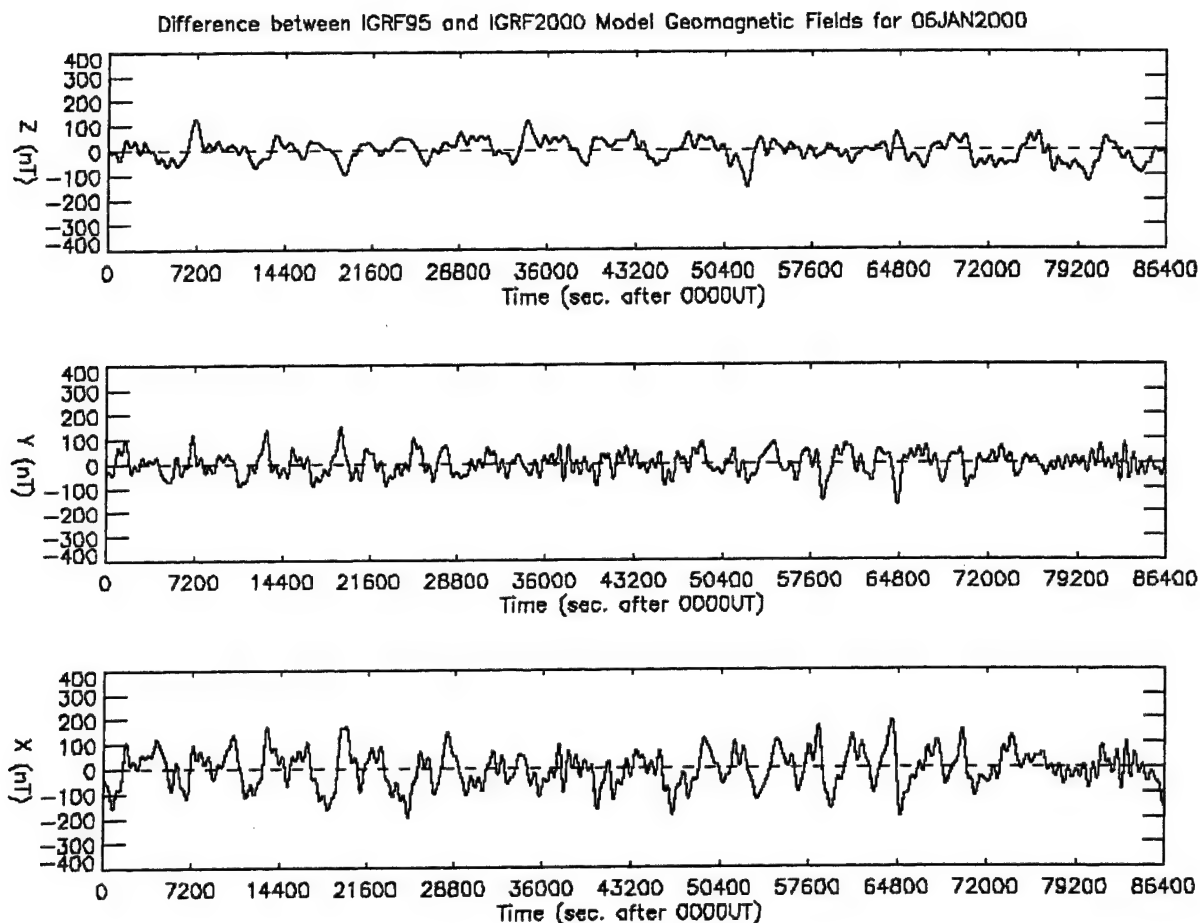


Figure 1. Change in Geomagnetic Model Field From IGRF95 to IGRF2000.

For day 2000-006, the first ascending node occurs at approximately 3799 seconds UT.

Based on a linear assumption of the rate of increase in error in the coefficients, that means that the maximum error could be assumed to grow as follows:

X: $\pm 3.2\text{nT}/30\text{days}$

Y: $\pm 2.7\text{nT}/30\text{days}$

Z: $\pm 2.3\text{nT}/30\text{days}$

Total Magnitude of difference: $3.4\text{nT}/30\text{days}$

The reduction in average absolute difference between the measured and modeled fields for IGRF 1995 to IGRF 2000 for that day was:

X: 42nT

Y: 11nT

Z: 17nT

Total Magnitude of difference: 44nT

Based on a linear assumption of the rate of increase in error in the coefficients, that means that the average error could be assumed to grow as follows:

X: 0.68nT/30days

Y: 0.17nT/30days

Z: 0.27nT/30days

Total Magnitude of difference: 0.72nT/30days

It should be noted that the linear assumption of increasing error in model over time is not necessarily valid. However, these figures do give an order-of-magnitude estimation for the errors involved.

2.3.3 Potential Ephemeris Errors

The comparison of the modeled and measured field requires knowledge of where the measurements were taken in order to determine the corresponding model field. Therefore ephemeris error can contribute to inaccuracies in the calibration. While the effect of random error due to imprecision of the ephemeris would hopefully be reduced by the use of multiple days of data for the calibration, any potential inaccuracies are unlikely to be thus reduced. See APPENDIX G for a discussion of TLE quality.

It is worth noting that as the ephemeris is generated over an orbit, it is likely that any ephemeris error will have an orbitally periodic affect, which mimics the orbitally periodic measured variation in the magnetic field. That is, the same ephemeris error will be in the same direction at the same point in the orbit, and the geomagnetic field will be similar at the same point in the orbit. As consecutive DMSP orbits are very similar, it is likely that both ephemeris errors and magnetic field errors, if any, would cause similar periodic patterns in the data.

Due to the nature of the observation and fitting process used to generate TLEs, it is expected that the position error they represent would most likely be in-track. Such an error was simulated by increasing the eccentricity of the orbit to yield an in-track position error over two consecutive orbits worth of data. This had the following results:

The difference between the modeled fields for unchanged eccentricity vs. eccentricity yielding a +/-1km error was a sinusoid in the range of:

X: -14 to +18nT

Y: -11 to +7nT

Z: -6 to +3nT

Total Magnitude of difference: 1 to 18nT

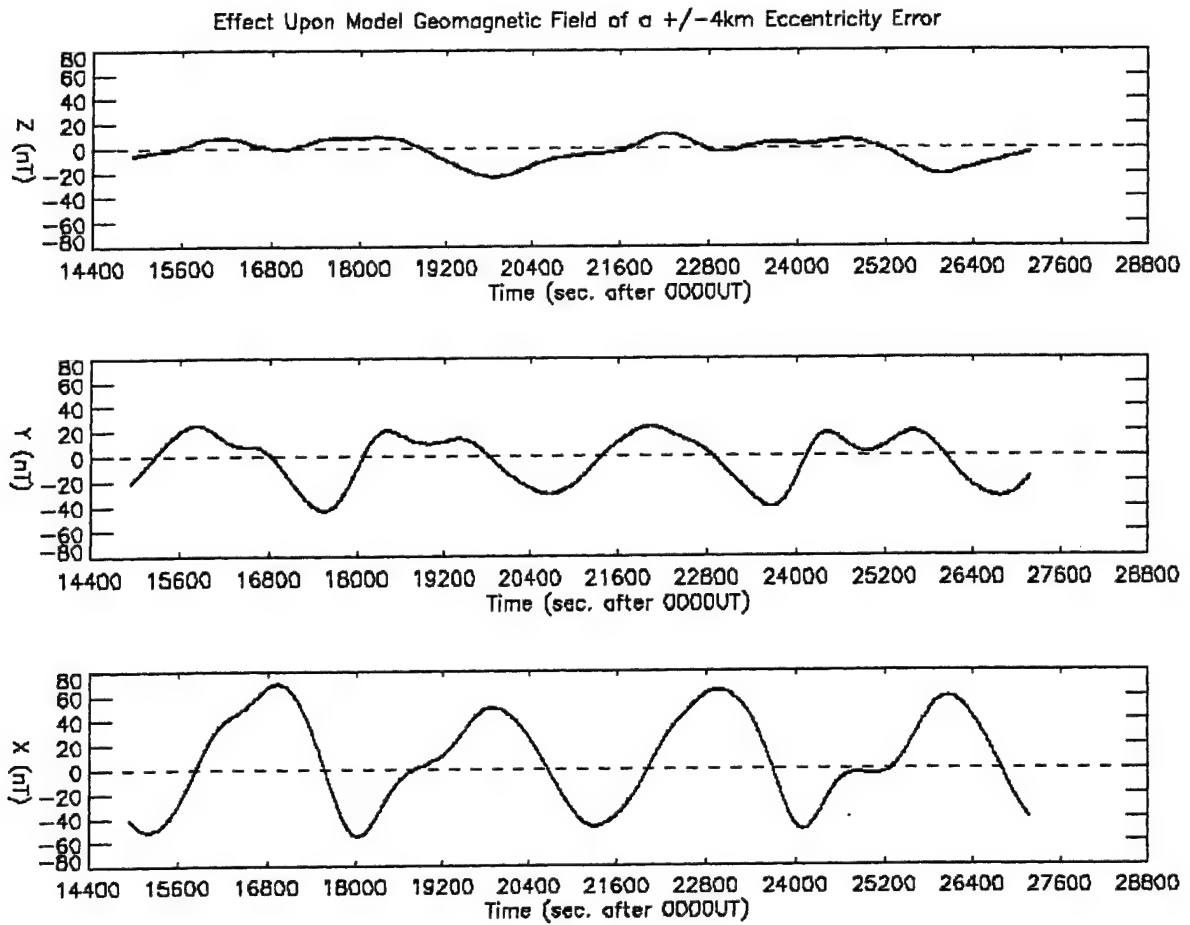


Figure 2. Effect Upon Model Geomagnetic Field of a ± 4 Km Eccentricity Error.

The increase in average absolute difference between the measured and modeled fields for unchanged eccentricity vs. eccentricity yielding a ± 1 km error was:

X: -2nT

Y: 0nT

Z: 1nT

Total Magnitude: -1nT

The range in difference between the modeled fields for unchanged eccentricity vs. eccentricity yielding a ± 4 km error was:

X: -58 to +72nT

Y: -45 to +25nT

Z: -24 to +12nT

Total Magnitude: 6 to 71nT

The first ascending node in the above plot occurs at approximately 14945 seconds UT.

The increase in average absolute difference between the measured and modeled fields for unchanged eccentricity vs. eccentricity yielding a +/-4km error was:

X: +3nT

Y: +1nT

Z: +5nT

Total Magnitude: +5nT

2.3.4 Potential Time Error

The measured field and modeled field are matched by time. If measurements are tagged as having been made at time T, then spacecraft position is calculated from TLEs for time T, and the model field for that position is then compared to the measured field for time T. The purpose of this Section is to gain an idea of the magnitude of error possible due to one or more of these time-tags being out of phase. Whether the potential time error is conceived of as due to a TLE giving the correct position but the wrong time, or to measurements not being tagged with the correct time, the result would be the same: a model field that is out of phase with the measured field.

A 1.0sec phase difference in the model field resulted in a sinusoidal error in the range:

X: +/-65nT

Y: -28 to +33nT

Z: -9 to +12nT

Total Magnitude of difference: 3 to 66nT

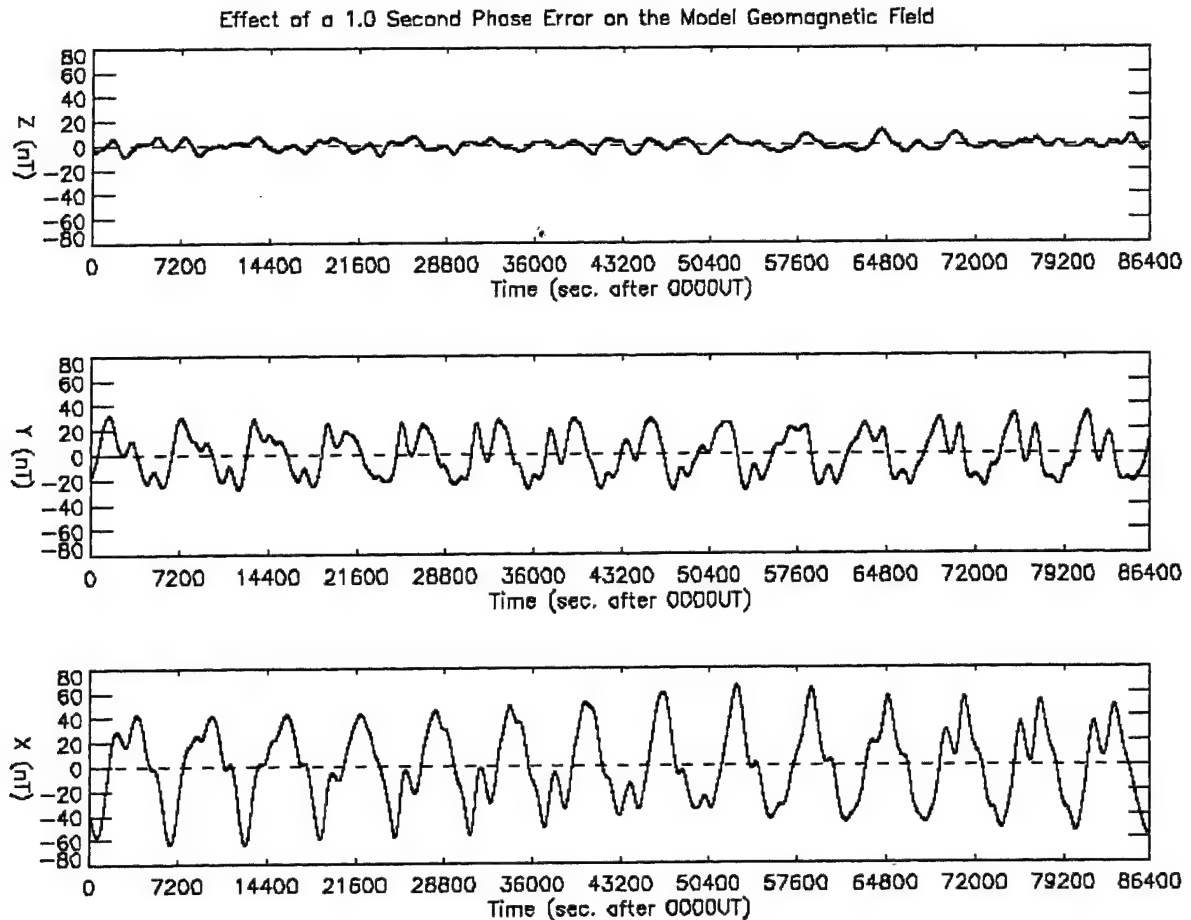


Figure 3. Effect of a 1.0 Second Phase Error on the Model Geomagnetic Field.

The first ascending node in the above plot occurs at approximately 3952 seconds UT.

The increase in average absolute difference between the measured and modeled fields for unchanged time vs. time + 1second for that day was:

X: 12nT

Y: 1nT

Z: 1nT

Total Magnitude: 9nT

2.3.5 Clipping

Clipping refers to the process of leaving out some data when calculating the in-flight calibration that produces the best match of measured to modeled. The calibration process is theoretically best when no ionospheric activity is present in the data so that measured should be equal to modeled. However, even on very "quiet" days, there is measurable ionospheric activity in the

auroral regions. The clipping process removes these auroral regions in order to calculate a calibration based solely on the data that meets the assumptions of the calibration process.

A combination of automatic and manual methods was used to snip. First, data from 12 geographic degrees of latitude equatorward, and 8 degrees poleward, of the predicted auroral region for a Q index of 2, was neglected. Then the data was examined graphically and a secondary list of those few regions missed by the automatic method was manually removed. In most cases, these regions occurred for those orbits that had above average activity compared to the rest of the day.

Three consecutive days of data were used to test the effect of clipping. By using consecutive days, it was hoped that the impact of other error sources could be minimized.

The range of errors between the three days as a result of calibrations derived with and without clipping was were sinusoids in the following ranges:

Day 2000-253:

X: -36 to 24nT

Y: -17 to 11nT

Z: -3 to -13nT

Total Magnitude of Error: 5 to 36nT

Day 2000-254:

X: -36 to 25nT

Y: -14 to 5nT

Z: -3 to -13nT

Total Magnitude of Error: 5 to 37nT

Day 2000-255:

X: -37 to 27nT

Y: -12 to 5nT

Z: -11 to -1nT

Total Magnitude of Error: 3 to 39nT

The three days had mean day Ap's of 4 to 5.

A second comparison was performed. The auroral regions from two orbits of data with Ap's near zero from day 2000-076 were curve-fitted by hand to generate near-perfect data. This data was then used to generate a calibration without errors due to clipping or ionospheric activity, and the resulting calibration compared with a clipped calibration for the same day. The error due to clipping for these orbits was a sinusoid in the range:

X: -42 to 48nT

Y: -39 to 24nT

Z: -17 to 6nT

Total Magnitude of Error: 5 to 57nT

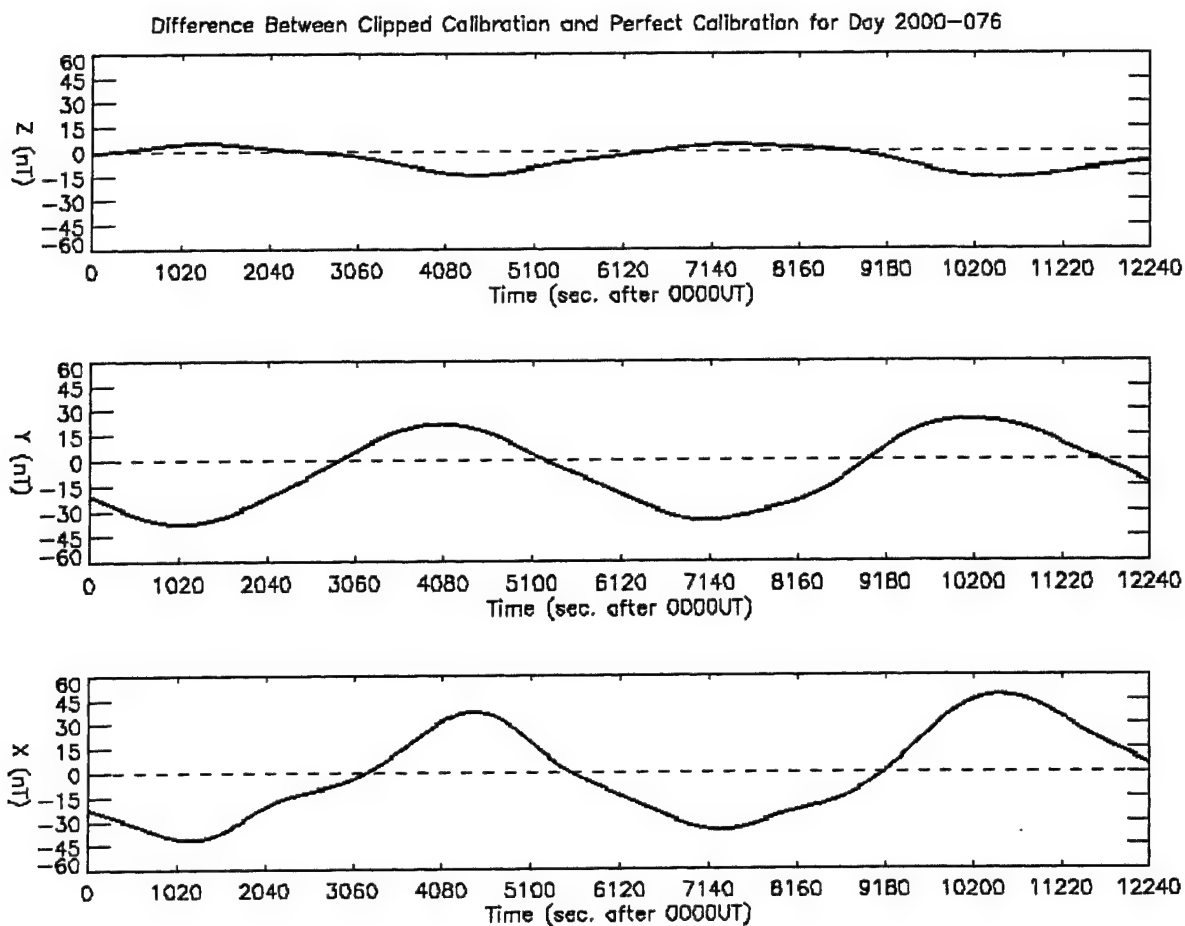


Figure 4. Difference Between Clipped Calibration and Optimal Calibration.

The first ascending node in the above plot occurs at approximately 68 seconds UT.

By comparing the a calibration based on the unclipped data for those two orbits to the calibration based on the curve-fitted data, it can be seen that the error due to the presence of the auroral regions even for this extremely quiet period was a sinusoid in the range:

X: -9 to 11nT

Y: -8 to 6nT

Z: -3 to 6nT

Total Magnitude of Error: 1 to 13nT

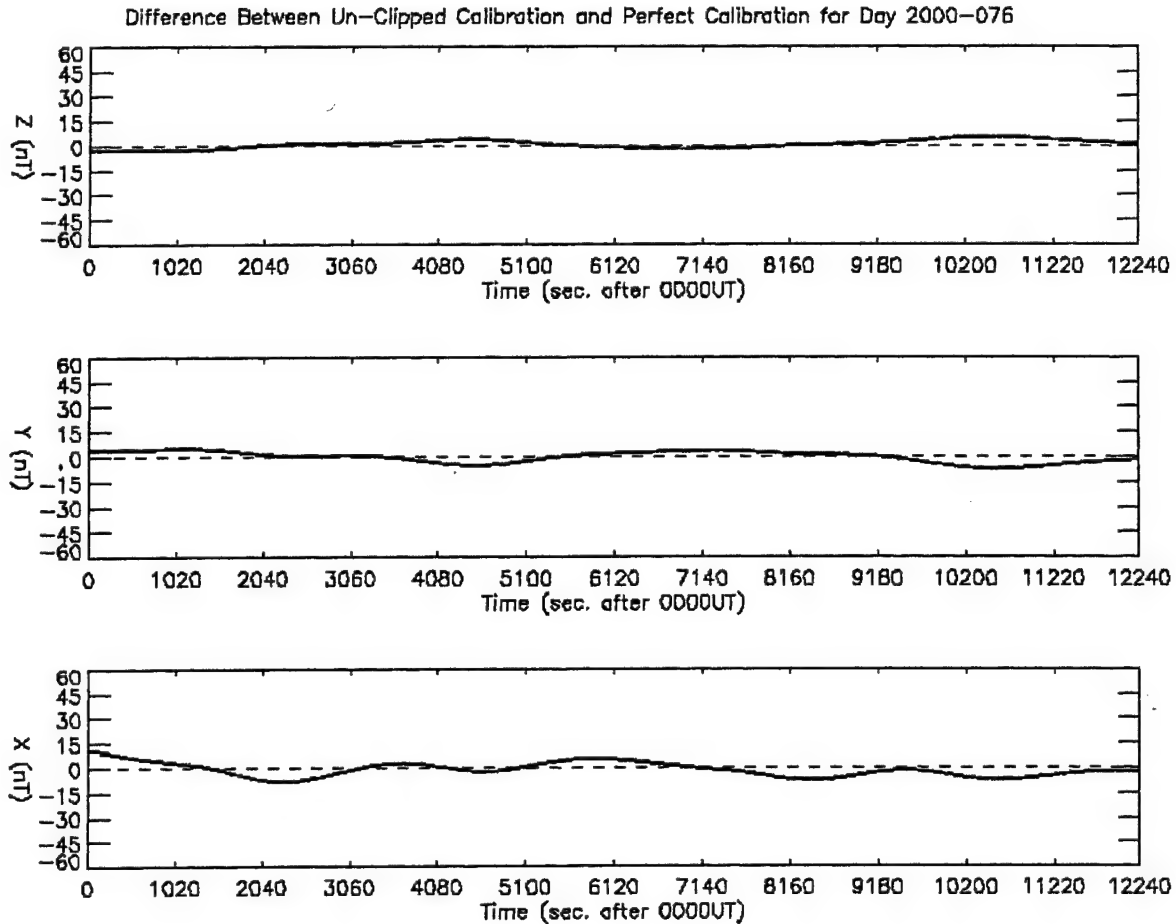


Figure 5. Difference Between Unclipped and Optimal Calibration.

The first ascending node in the above plot occurs at approximately 68 seconds UT.

While the initial observation is that clipping does more harm than good, it should be noted that finding more than two consecutive extremely quiet orbits is well nigh impossible. Lacking a large amount of very quiet data, a calibration without clipping must either be based on a limited amount of data with no hope of averaging out orbit-dependent differences, or must include a substantial number of orbits containing a relatively high amount of activity. The solution of curve-fitting the auroral regions of large numbers of orbits must be excluded as it is both subjective and enormously time consuming; the latter factor would make repeatability, evaluation, and use upon multiple days within a year prohibitive.

2.3.6 Accuracy of the Calibration Process for One Day of Data

Even with clipping, and using multiple orbits for the calibration, some error will remain due to non-auroral ionospheric activity, ephemeris error, imperfect clipping, bias due to clipping, accuracy of the model geomagnetic field, and other non-ideal factors. Three successive days

were used to generate three calibrations, and the effects of those calibrations upon the measured-minus-modeled field were evaluated to determine the maximum possible precision of the calibration process. It should be noted however, that the use of multiple days of data to generate each calibration should reduce some of these errors, but the lack of sufficient consecutive quiet days of data precluded such an analysis.

The range of the differences between three consecutive calibrations based on a full day's data is given below:

Day 2000-253 vs. day 2000-254:

X: +/-5nT

Y: +/-11nT

Z: -2 to 0nT

Total Magnitude of Error: 1 to 12nT

Day 2000-254 vs. day 2000-255:

X: +/-8nT

Y: +/-12nT

Z: -7 to 1nT

Total Magnitude of Error: 3 to 14nT

Day 2000-253 vs. day 2000-255:

X: +/-12nT

Y: +/-20nT

Z: -8 to 0nT

Total Magnitude of Error: 8 to 21nT

The change in absolute average measured-minus-modeled field for each day between the three calibrations is given below:

Day 2000-253 vs. day 2000-254:

X: 1nT

Y: 1nT

Z: 0nT

Total Magnitude of Error: 0nT

Day 2000-254 vs. day 2000-255:

X: 1nT

Y: 0nT

Z: 1nT

Total Magnitude of Error: 0nT

Day 2000-253 vs. day 2000-255:

X: 2nT

Y: 1nT

Z: 1nT

Total Magnitude of Error: 0nT

2.3.7 Other Potential Sources of Calibration Error

Other potential sources of calibration error include sensor break-in, sensor drift, seasonal or day/night variation in temperature resulting in boom twist, error in the model field, magnetic activity other than clipped auroral activity, and unknown artifacts in the data. It bears repeating that the form of the calibration limits the type of error that can be corrected. Only those errors that are functions of the magnetic field are conceivably corrected; time and date dependent errors not only cannot be corrected by this calibration, they limit the accuracy of calibration. See Section 3 for a discussion of some of the phenomena observed in the data.

2.4 Preliminary Calibration Matrices

While the rigorous calibration process described in Section 2.2 was eventually performed to yield the early and late calibrations given in Sections 2.5 and 2.6, those calibrations could only be performed after substantial evaluation of the data. Evaluation of the data required preliminary calibrations to allow graphical and other analysis without the dominating effect of the lack of a calibration. Accordingly, preliminary calibrations were developed as described below. It should be noted that the definitive early and late calibration matrices were not used in the experiments discussed in Sections 4 and in [Sexton and Cook, 2000]. These experiments were performed with preliminary calibration matrices instead.

2.4.1 Preliminary Late Calibration Matrices

A preliminary version of the early calibration matrices was used for all studies in Section 4.9 except for the in-flight recalibration. A preliminary version of the late in-flight calibration matrices was computed for each of the following days:

Day 2000-231: 08/18/2000
Day 2000-233: 08/20/2000
Day 2000-235: 08/22/2000
Day 2000-238: 08/25/2000

Their calibration matrices are listed below:

| ORTHO | | | OFFSET |
|-------------------------------|-------------|-------------|--------|
| 18 August 2000 (Day 2000-231) | | | |
| 0.99198131 | 0.00581004 | 0.00879947 | -30.23 |
| 0.00004992 | 0.99574205 | -0.00289133 | -4.34 |
| 0.00205065 | -0.00281425 | 0.98931262 | 2.54 |
| 20 August 2000 (Day 2000-233) | | | |
| 0.99203124 | 0.00533068 | 0.00874869 | -30.59 |
| 0.00008274 | 0.99539845 | -0.00348888 | -4.76 |
| 0.00202968 | -0.00243739 | 0.98914056 | 2.88 |

| | | | |
|-------------------------------|-------------|-------------|--------|
| 22 August 2000 (Day 2000-235) | | | |
| 0.99189387 | 0.00410800 | 0.01109731 | -27.21 |
| 0.00067430 | 0.99582770 | -0.00242590 | -6.55 |
| 0.00071572 | -0.00320961 | 0.99006950 | 2.54 |

| | | | |
|-------------------------------|-------------|-------------|--------|
| 25 August 2000 (Day 2000-238) | | | |
| 0.99204054 | 0.00329139 | 0.00992527 | -33.17 |
| 0.00048404 | 0.99545452 | -0.00236634 | -2.09 |
| 0.00063384 | -0.00333600 | 0.99052002 | 6.67 |

By a very slim margin, the calibration matrices from Day 2000-231 appear to be the most typical of the four, and were used as the preliminary late calibration for F15.

It is noteworthy that these differences among the days are very close to the same level as those among the previous calibration from early March 2000.

The ORTHO calibration matrix for Day 2000-231 was converted to rotation angles A, B, and C to compare these angles with the angles in the first table of Section 4.9.1.2, which deals with the field-versus-time plots. The converted angles for Day 2000-231 in degrees were:

A = -0.165668
 B = -0.504179
 C = 0.332906

The above solution angles were checked and found to be fairly precise.

2.4.2 Preliminary Early Calibration Matrices

In addition to the above calibration matrices for Day 2000-231, preliminary early calibration matrices were also selected. Among the matrices for Days 2000-009, 2000-012, 2000-017, and 2000-025, Day 2000-012 was chosen.

The ORTHO calibration matrix for Day 2000-012 was converted to rotation angles A, B, and C to compare these angles with the angles in the first table of Section 4.9.1.2, which deals with the field-versus-time plots. The converted angles for Day 2000-012 in degrees were:

A = -0.140528
 B = -0.712907
 C = 0.410781

The above solution angles were checked and found to be fairly precise.

2.4.3 Preliminary Late Versus Preliminary Early Calibration Matrices

A comparison plot of the difference between the measured-minus-modeled field for Day 2000-145 using the preliminary early and the preliminary late calibrations yielded smooth curves,

except for jump discontinuities in the Z-axis curve at UT = 50,990 seconds and UT = 53,000 seconds. For each axis (X, Y, or Z), the maximum absolute field strength in the difference was:

56 nT for the X-axis
 44 nT for the Y-axis
 184 nT for the Z-axis

The average absolute values of field strength were:

21.75 nT for the X-axis
 21.17 nT for the Y-axis
 35.23 nT for the Z-axis

2.5 Final Early Calibration

With the errors discussed above in mind, a precise early in-flight calibration was attempted. In order to average-out day-to-day errors without introducing long-period errors, three consecutive quiet days were desired. However, the concentration of days exhibiting or possibly exhibiting the Z-wave phenomena (Section 3.3) in the early part of the year meant that the first group of suitably quiet days was not available until days 049, 050, and 051 of year 2000. The days were snipped automatically and manually, and the fields from all three days combined to average out error. This calibration differs from those listed in the March 2000 calibration report due to the use of rigorous clipping, the availability of early year TLEs, the use of 3 days of data instead of just one. The resultant calibration was:

$$\begin{bmatrix} B_x' \\ B_y' \\ B_z' \end{bmatrix} = \begin{bmatrix} 0.99528597 & 0.00917236 & 0.00593256 \\ -0.00033594 & 0.99729121 & -0.00337577 \\ 0.00108272 & -0.00326025 & 0.99352186 \end{bmatrix} \begin{bmatrix} B_x \\ B_y \\ B_z \end{bmatrix} + \begin{bmatrix} -20.65 \\ -13.17 \\ -1.77 \end{bmatrix} \quad (2)$$

2.6 Final Late Calibration

With the errors discussed above in mind, a precise late in-flight calibration was attempted. In order to average-out day-to-day errors without introducing long-period errors, three consecutive quiet days were desired. The days 253, 254, and 255 of year 2000 were selected. The days were snipped automatically and manually, and the fields from all three days combined to average out error. This calibration differs from those listed in the March 2000 calibration report due to the use of rigorous clipping, the availability of early year TLEs, the use of 3 days of data instead of just one, and of course the fact that it is some 6-7 months later. The resultant calibration was:

$$\begin{bmatrix} B_x' \\ B_y' \\ B_z' \end{bmatrix} = \begin{bmatrix} 0.99517418 & 0.00863488 & 0.00699771 \\ -0.00055869 & 0.99756404 & -0.00291095 \\ 0.00022768 & -0.00329771 & 0.99405258 \end{bmatrix} \begin{bmatrix} B_x \\ B_y \\ B_z \end{bmatrix} + \begin{bmatrix} -16.65 \\ -10.14 \\ -0.68 \end{bmatrix} \quad (3)$$

2.7 Differences Between Early And Late Final Calibrations

Both calibrations were used to process data from day 2000-253.

The range of the differences between the effects of the two calibrations are:

X: $\pm 18\text{nT}$

Y: $\pm 15\text{nT}$

Z: $\pm 38\text{nT}$

Total Magnitude: 8 to 41 nT.

Typical angle difference: 0.0239deg

Typical magnitude difference: 11 nT

Where "Typical angle difference" is the angle between the resulting vectors of applying the two calibrations to a field vector of [18000 18000 18000] nT, and "Typical magnitude difference" is the difference in magnitude between those two resulting calibrated vectors.

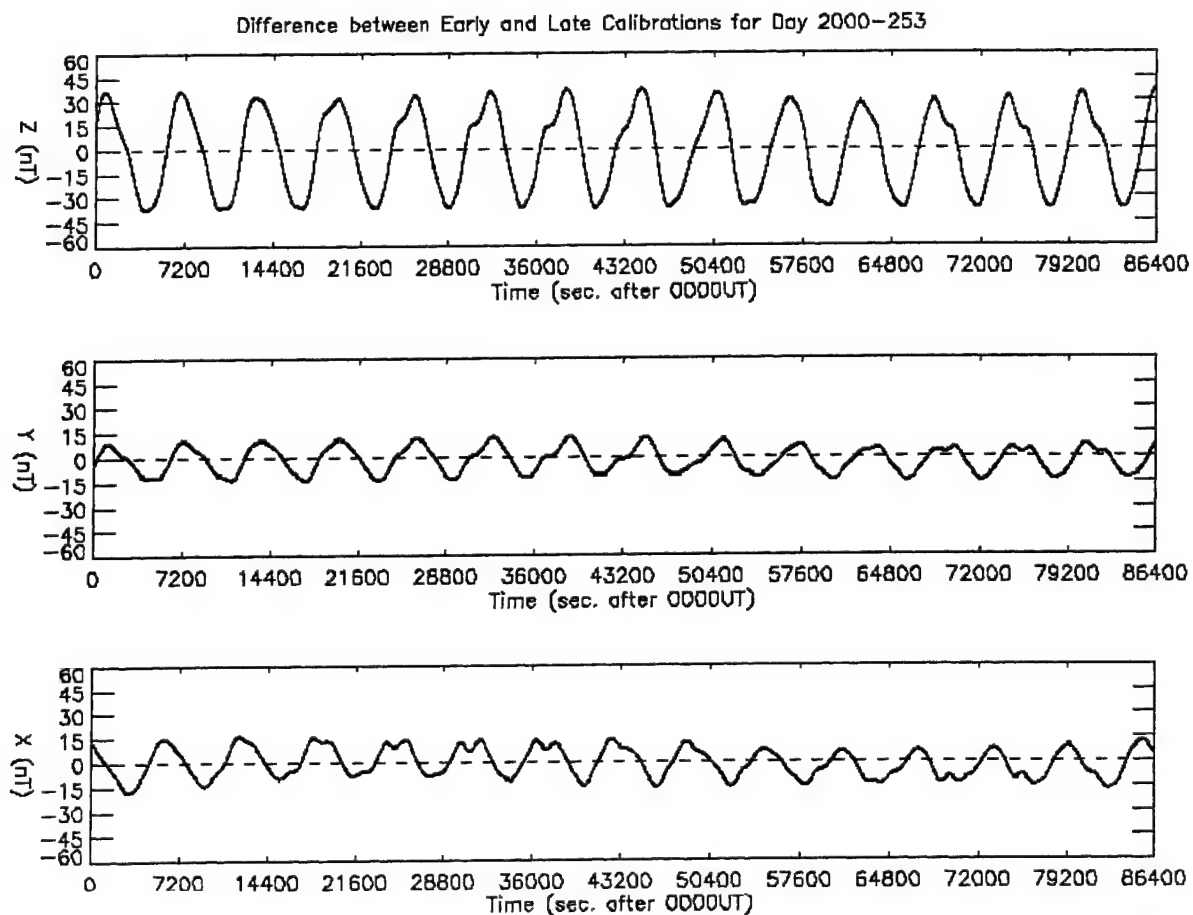


Figure 6. Difference Between Final Early and Late Calibrations.

The first ascending node in the above plot occurs at approximately 2799 seconds UT.

Since day 253 is much closer chronologically to the later calibration than the earlier one, it was expected that the average absolute difference between measured and modeled fields would be lower for the later calibration versus the earlier one. The following were the amounts by which the average absolute differences were reduced for day 2000-253 by using the later calibration vice the early calibration:

X: 2.4nT

Y: 0.3nT

Z: 6.7nT

Total Magnitude: 4.8nT.

2.8 Switchover Date From Early Calibration To Later Calibration

With the various potential and actual factors causing the need for regular recalibration, the question arises: upon which date should the processing of SSM DMSP F15 data switch from one calibration to the later one? Given the precision of the calibration (Section 2.9), the accuracy of the calibration process (Section 2.3.6), versus the unknown or comparatively small magnitude (Section 2.3.2) changing factors, it is obvious that this question cannot be answered precisely.

An estimate was obtained by calculating the average absolute difference between the measured and modeled field for each orbit of data, using both calibrations. These two sets of results represent how close the measured field was to the modeled field for each orbit. By differencing the two results for each orbit, an estimate of how much better one calibration is than the other is obtained. The differences where the A_p for that orbit is 20 or less are then plotted in each axis and for magnitude. As expected, the plots of these differences are not smooth curves, but some trends may be observed. Based on these curves, it is suggested that processing of data use the later calibration from day 098 of 2000 onward, and the earlier calibration before that time. Note that axis and magnitude difference plots displayed the same behavior whether the average absolute differences being compared included auroral regions or not.

Preferred Calibration for Each Day for All Axes (All Points)

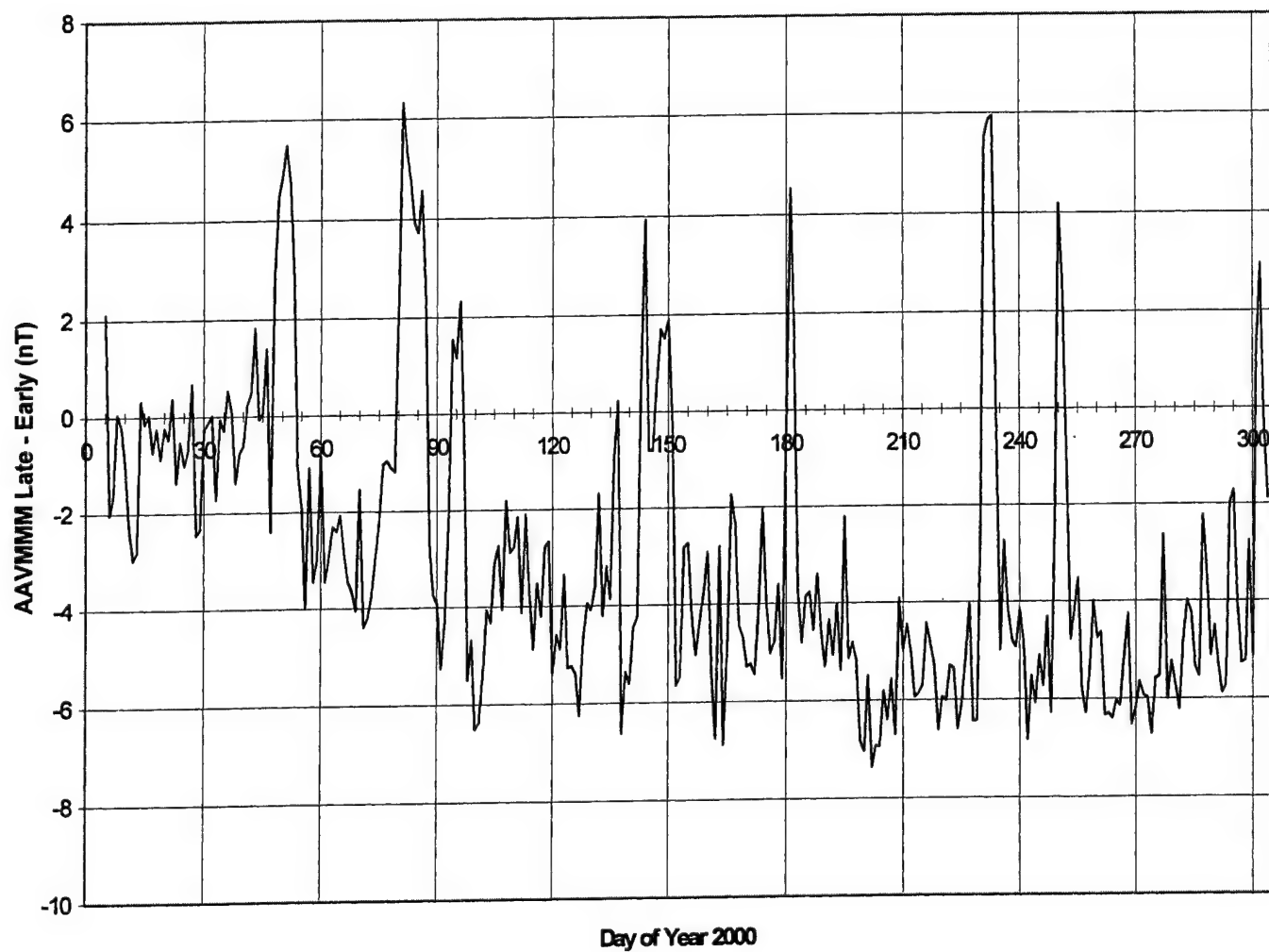


Figure 7. Determining Preferred Calibration for Each Day for All Axes.

2.9 Precision Of The Calibration

As the calibration attempts to zero the difference between the measured and modeled fields for quiet periods, the resultant calibrated measured-minus-modeled field is considered to indicate the precision of the calibration. These values were plotted, and typical results can be seen Section 3.1. The average difference from zero of the measured-minus-modeled field for quiet days was therefore studied. This value showed ranges in each axis, and when broken down on a per orbit basis. Table 1 defines the precision of the calibration:

| TABLE 1. Precision of the Calibration | | | | |
|---------------------------------------|--------------|---|------------|---|
| Axis | Average (nT) | Amplitude of Representative Sinusoid (nT) | Range (nT) | Amplitude Range of Representative Sinusoid (nT) |
| X (down) | 25 | 39 | 21-30 | 33-47 |
| Y (velocity) | 44 | 69 | 38-52 | 60-82 |
| Z (orbit normal) | 25 | 39 | 14-52 | 22-82 |
| Magnitude | 64 | 101 | 52-89 | 82-140 |

These values are for non-auroral regions on quiet days, excluding outliers. Precisely speaking, they are determined from the most typical 93 percent of points in each axis, where each data point is the average distance from zero of the measured minus modeled field in non-auroral regions for one day UT. Only days with Aps of 20 or less were considered, and auroral regions were defined per the same criteria as automated clipping. See Section 2.3.5 for a description of clipping criteria. The 93 percent cut-off of outlying points was chosen graphically and to avoid those days affected by the Z-wave described in Section 3.3. Only days 005 through 304 of year 2000 were available to contribute to this estimation. Amplitude of a representative sinusoid is the amplitude of a sinusoidal function that would have that same average difference from zero of the measured-minus-modeled field.

These results are consistent with the curves observed in the plots of measured-minus-modeled field. See Section 3.1 for an example.

Precision of the Calibration for Each Low Ap Day (Non-Auroral Points)

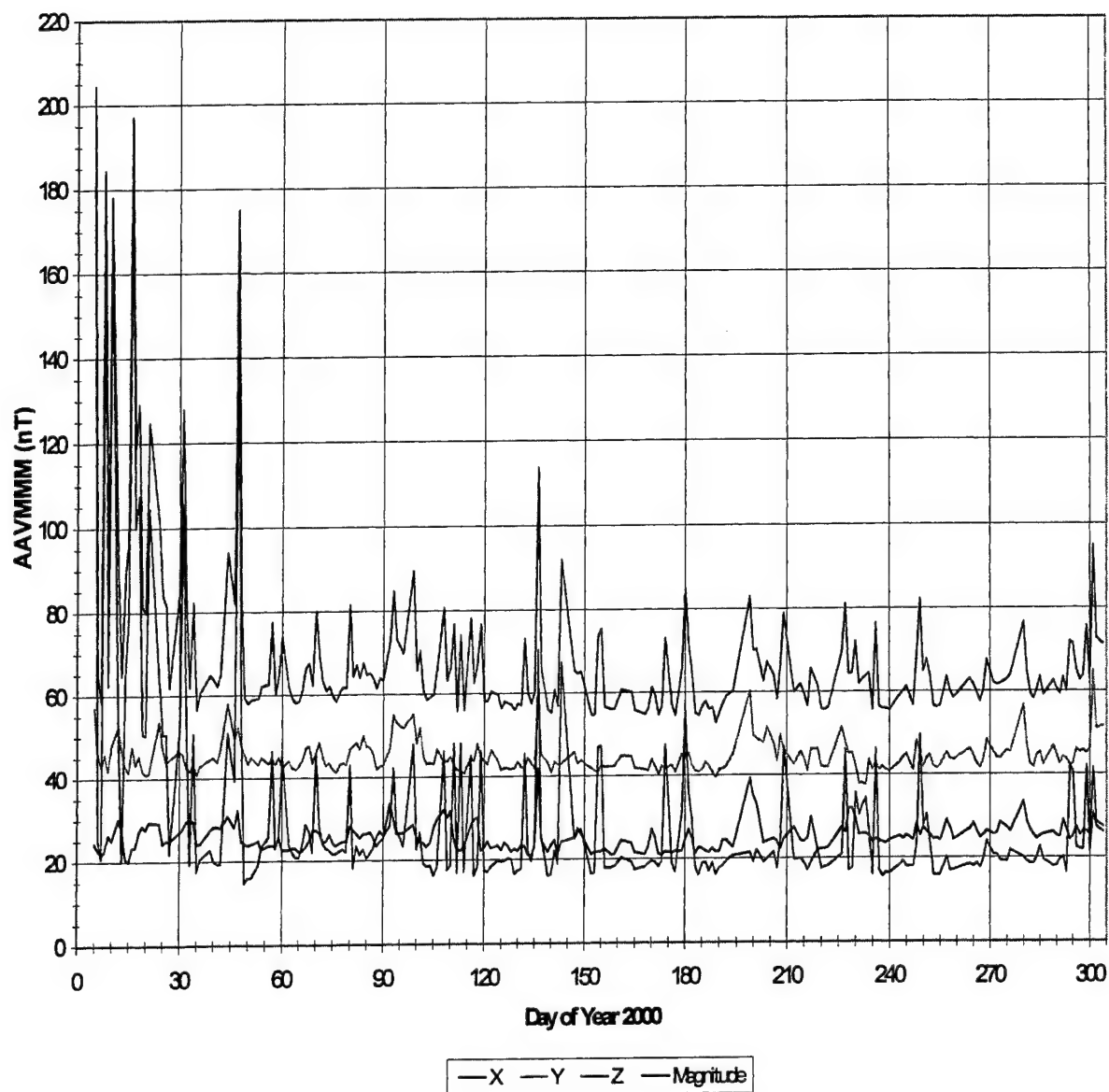


Figure 8. Precision of the Calibration for Each Low Ap Day.

2.10 An Attempt To Calculate Calibration Drift

In part, the calibration represents a correction for a continual twist by applying an opposite twist. Thus, the change in calibration over the study period of several months should have the same magnitude as, but the opposite direction of, the change in continual twist over this study period.

Unfortunately, because of the cyclical nature of the field and the resulting effect of continual twist or calibration, one cannot compare the average or maximum nT computed below in Section 4.9.1. For example, the change in nT due to a new twist on a new date can be the same amount, but in a different direction, or at a different time. While that will show up to some extent (because we are examining the effect on the vector field), it should be done in a manner easier to grasp. For the purposes of the comparison, we will ignore the OFFSET matrix (i.e. the 3x1 additive correction matrix) because it is not solved for as part of the continual twist.

The continual twist for each day of prefile data is recorded in the first table of Section 5.9.1.2 below as three perpendicular angles A, B, and C. Hence to make the comparison meaningful, we first convert each of the old and new ORTHO calibration matrices to rotation angles A, B, and C. Another important quantity, the 3-D total twist, can then be computed as:
Total = $\sqrt{A^2 + B^2 + C^2}$.

The ORTHO calibration matrices for Days 2000-012 and 2000-231 are repeated here for reference.

12 January 2000 (Day 2000-012)

| | | |
|------------|-------------|-------------|
| 0.99195034 | 0.00716887 | 0.01244225 |
| 0.00071688 | 0.99665388 | -0.00245248 |
| 0.00104727 | -0.00427213 | 0.99086193 |

18 August 2000 (Day 2000-231)

| | | |
|------------|-------------|-------------|
| 0.99198131 | 0.00581004 | 0.00879947 |
| 0.00004992 | 0.99574205 | -0.00289133 |
| 0.00205065 | -0.00281425 | 0.98931262 |

We must express each ORTHO matrix as a rotation of three angles in the form $R_A R_B R_C$, where:

$$R_A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & cA & sA \\ 0 & -sA & cA \end{bmatrix}, \quad R_B = \begin{bmatrix} cB & 0 & -sB \\ 0 & 1 & 0 \\ sB & 0 & cB \end{bmatrix}, \quad R_C = \begin{bmatrix} cC & sC & 0 \\ -sC & cC & 0 \\ 0 & 0 & 1 \end{bmatrix}, \quad (4)$$

cA, cB, and cC are shorthand for $\cos(A\pi/180)$, $\cos(B\pi/180)$, and $\cos(C\pi/180)$, respectively, and sA, sB, and sC are shorthand for $\sin(A\pi/180)$, $\sin(B\pi/180)$, and $\sin(C\pi/180)$, respectively. The $\pi/180$ adjustment is due the fact that A, B, and C are the twist angles in degrees, not radians.

We write out the product $R_A R_B R_C$ as:

$$R_A R_B R_C = \begin{bmatrix} cBcC & cBsC & -sB \\ sAsBcC - cAsC & sAsBsC + cAcC & sAcB \\ cAsBcC + sAsC & cAsBsC - sAcC & cAcB \end{bmatrix} \quad (5)$$

and equate $R_A R_B R_C$ to a given 3x3 ORTHO matrix:

$$ORTHO = \begin{bmatrix} g_{11} & g_{12} & g_{13} \\ g_{21} & g_{22} & g_{23} \\ g_{31} & g_{32} & g_{33} \end{bmatrix}, \quad (6)$$

from which it is clear that $sB = -g_{13}$. Since the definition of sB is $\sin(B\pi/180)$, we have $B = \sin^{-1}(-g_{13}) * 180/\pi = -\sin^{-1}(g_{13}) * 180/\pi$. Once B is known, we deduce from $cBsC = g_{12}$ that $\sin(C\pi/180) = sC = g_{12}/cB$ and thus $C = \sin^{-1}(g_{12}/cB) * 180/\pi$. Similarly, from $sAcB = g_{23}$ we obtain $A = \sin^{-1}(g_{23}/cB) * 180/\pi$.

For the ORTHO matrix of Day 2000-012, the above computation yields the following angles in degrees:

$$\begin{aligned} A &= -0.140528 \\ B &= -0.712907 \\ C &= 0.410781 \end{aligned}$$

For the ORTHO matrix of Day 2000-231, the above computation yields:

$$\begin{aligned} A &= -0.165668 \\ B &= -0.504179 \\ C &= 0.332906 \end{aligned}$$

In a theory treating ORTHO as a rotation matrix, each ORTHO matrix should be orthogonal; that is, the matrix product $(ORTHO)^T * ORTHO$ should equal I . Here T stands for matrix transpose and I = the 3x3 identity matrix. Now define the maximum error of orthogonality as the entry in $[(ORTHO)^T * ORTHO - I]$ with the maximum absolute value. This error is 0.018173 and 0.021248 for Days 2000-012 and 2000-231, respectively. Similarly, the maximum absolute value among the entries in the error matrix $(R_A R_B R_C - ORTHO)$ is 0.013507 and 0.010867 for Days 2000-012 and 2000-231, respectively. Thus, the angles A , B , and C computed above are fairly precise.

Table 2 combines the above computed angles A , B , and C with the angles from the first table in Section 4.9.1.2. This chart also contains the subsequently computed quantities necessary to determine to what extent calibration drift is present in the data and whether the calibration matrices compensate for such drift.

| TABLE 2. A Study of Change in Calibration Rotation Angles | | | | | | | |
|---|-----------|-----------|----------|----------|-----------|----------|-----------|
| | CT050 | CT083 | D | D/dd | CT116 | D | D/dd |
| A | -0.011169 | 0.035353 | 0.046522 | 0.00141 | 0.036364 | 0.001011 | 0.000031 |
| B | -0.067365 | -0.003893 | 0.063472 | 0.001923 | 0.027024 | 0.030917 | 0.000937 |
| C | 0.001566 | -0.011807 | -0.01337 | -0.00041 | -0.015181 | -0.00337 | -0.000102 |
| Total | 0.068303 | 0.037475 | -0.03083 | -0.00093 | 0.047782 | 0.010307 | 0.000312 |

| | CT149 | D | D/dd | CT182 | D | D/dd |
|-------|----------|----------|----------|----------|----------|----------|
| A | 0.138719 | 0.102355 | 0.003102 | 0.146984 | 0.008265 | 0.00025 |
| B | 0.021608 | -0.00542 | -0.00016 | 0.046335 | 0.024727 | 0.000749 |
| C | 0.074791 | 0.089972 | 0.002726 | 0.084324 | 0.009533 | 0.000289 |
| Total | 0.159071 | 0.111289 | 0.003372 | 0.175675 | 0.016604 | 0.000503 |

| | CT215 | D | D/dd | CA012 | CA231 | CalD | CalD/dd |
|-------|----------|----------|----------|----------|----------|----------|----------|
| A | 0.070963 | -0.07602 | -0.0023 | -0.14053 | -0.16567 | -0.02514 | -0.00011 |
| B | 0.053667 | 0.007332 | 0.000222 | -0.71291 | -0.50418 | 0.208728 | 0.000953 |
| C | 0.035953 | -0.04837 | -0.00147 | 0.410781 | 0.332906 | -0.07788 | -0.00036 |
| Total | 0.095961 | -0.07971 | -0.00242 | 0.834704 | 0.626475 | -0.20823 | -0.00095 |

In the left-hand column of each section:

A = Angle A, in degrees

B = Angle B, in degrees

C = Angle C, in degrees

Total = $\sqrt{A^2 + B^2 + C^2}$ only in columns headed by "CTxxx" or "CAxxx". In columns marked "D" and "CalD", "Total" is the difference between the current and previous values of $\sqrt{A^2 + B^2 + C^2}$. In columns marked "D/dd" or "CalD/dd", "Total" is the value to the immediate left (in column "D" or "CalD") divided by number of days between measurements (33 for column "D/dd" or 219 for column "CalD/dd").

and in the top row of each section, for each angle (A, B, or C) and Total:

CTxxx = Continual Twist angle for Day 2000-xxx

D = Difference between angle of current and previous sample days. For example, the "D" that follows "CT116" is (Day-116 angle minus Day-083 angle).

D/dd = Average angle difference per day. Here "dd" = 33 days between successive samples.

CA012 = Continual Twist angle from ORTHO calibration matrix for Day 2000-012

CA231 = Continual Twist angle from ORTHO calibration matrix for Day 2000-231

CalD = (Day-231 calibration-matrix angle minus Day-012 calibration-matrix angle)

CalD/dd = Average angle difference per calibration day. Here "dd" = 231 - 012 = 219 days.

From the "D/dd" columns in the Table 2 above, the least-squares solution of Angle A rises almost steadily but falls at the end of the 165-day interval between the first and last sample days, averaging a gain of 0.002493 degrees per day. Angle B rises almost steadily but falls a bit in the

middle, with an average gain of 0.003671 degrees per day. Angle C and the total rotation angle rise in the middle and fall at the beginning and end, posting respective overall rises of only 0.001033 and 0.000838 degrees per day. From these figures it can be deduced that the angles tend to rise steadily, and each angle is greater at the end of the 165 days than at the beginning. This finding signals a drift in the calibration angles, especially in Angle B.

The angular changes in the ORTHO matrix are easily read from the "CalD/dd" column. In the ORTHO matrix for Day 2000-231, Angle A decreases by an average of 0.00011 degrees per day since Day 2000-012. Angle B increases by 0.000953 degrees per day, and Angle C falls by 0.00036 degrees per day. The total angle drops 0.00095 degrees per day, which is close to the 0.000838-degree daily rise of the total angle for the data days. Hence, the above analysis shows that the difference between the calibration matrices of Days 2000-012 and 2000-231 corrects for the perceived angular drift over the data days. However, the relative magnitudes of the angles in question, their inconsistent trending, and the limited number of samples may indicate that these results are in the noise.

3. OBSERVED PHENOMENA

This Section describes those phenomena that were noted in the data post-calibration.

Section 3.1 shows samples of calibrated data for quiet, active, and very quiet days and discusses the difference between their appearances. Section 3.2 addresses equipment-induced jumps in the magnetic field. Section 3.3 deals with the appearance of a significant wave in the Z-curve for some data days but not for others. Section 3.4 discusses a sawtooth wave in the X-curve. Section 3.5 investigates whether the remaining curves in the quiet measured-minus-modeled field are due to a constant time error resulting in out-of-phase magnetic fields. In Section 3.6, a study compares the modeled field and other results of current IGRF-2000 coefficients that have been used in APSM, with similar results from a new set of coefficient values based on measurements of the Ørsted satellite [Olsen, *et al.*, 2000].

3.1 Appearance Of Calibrated Data

This Section contains three sample plots of the calibrated data:

The plot that follows shows two orbits of quiet measured-minus-modeled data from a non-Z wave day, in all three dimensions, output range ± 1000 nT. Hanging vertical ticks near the top of the box around each axis plot indicate ascending nodes of the satellite orbit.

DMSP F15 SSM Data from Julian Day 087
Baseline APSM

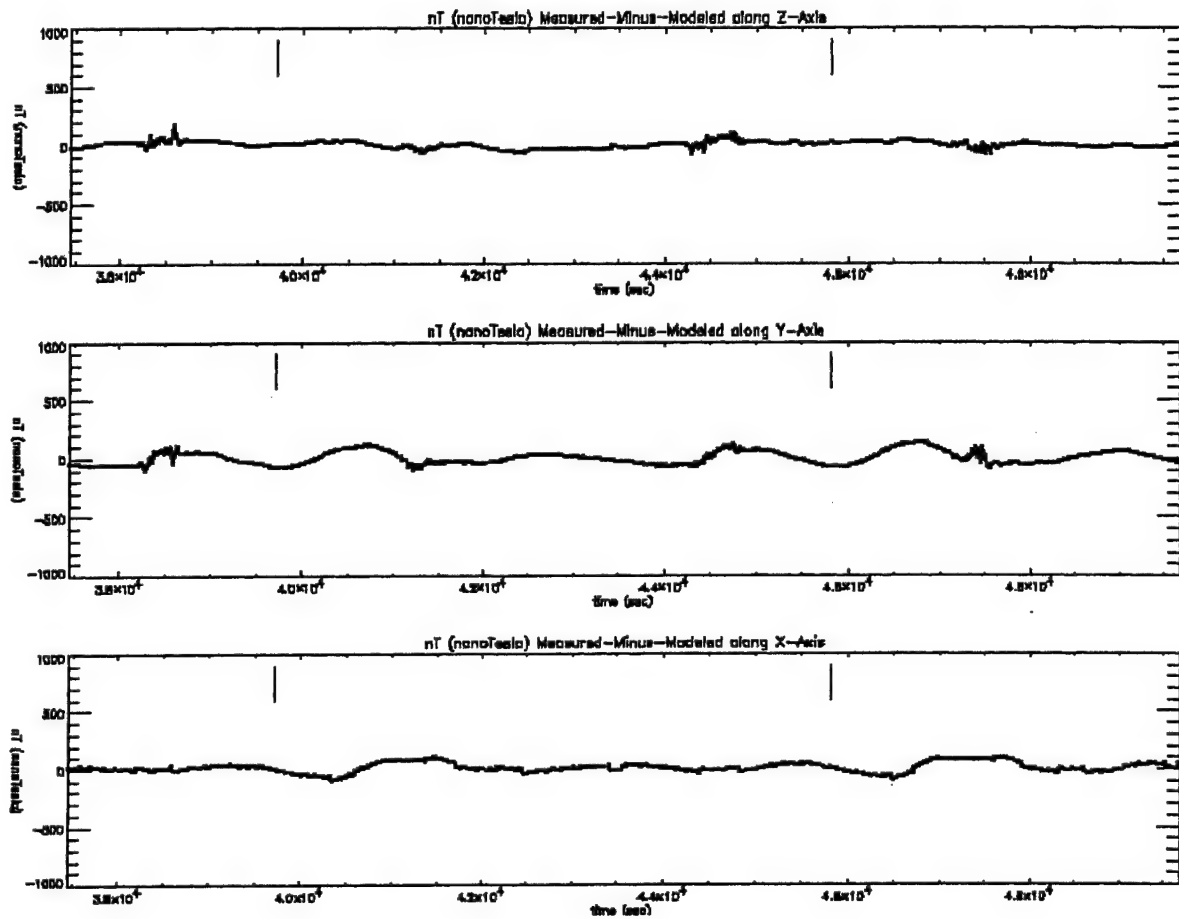


Figure 9. Quiet Day Calibrated Measured-Minus-Modeled Data.

Figure 10 shows two orbits of active measured-minus-modeled data from a non-Z wave day, all three dimensions, output range ± 1000 nT for axes X and Y and ± 1300 nT for the Z-axis to fit its curve. Hanging vertical ticks near the top of the box around each axis plot indicate ascending nodes of the satellite orbit.

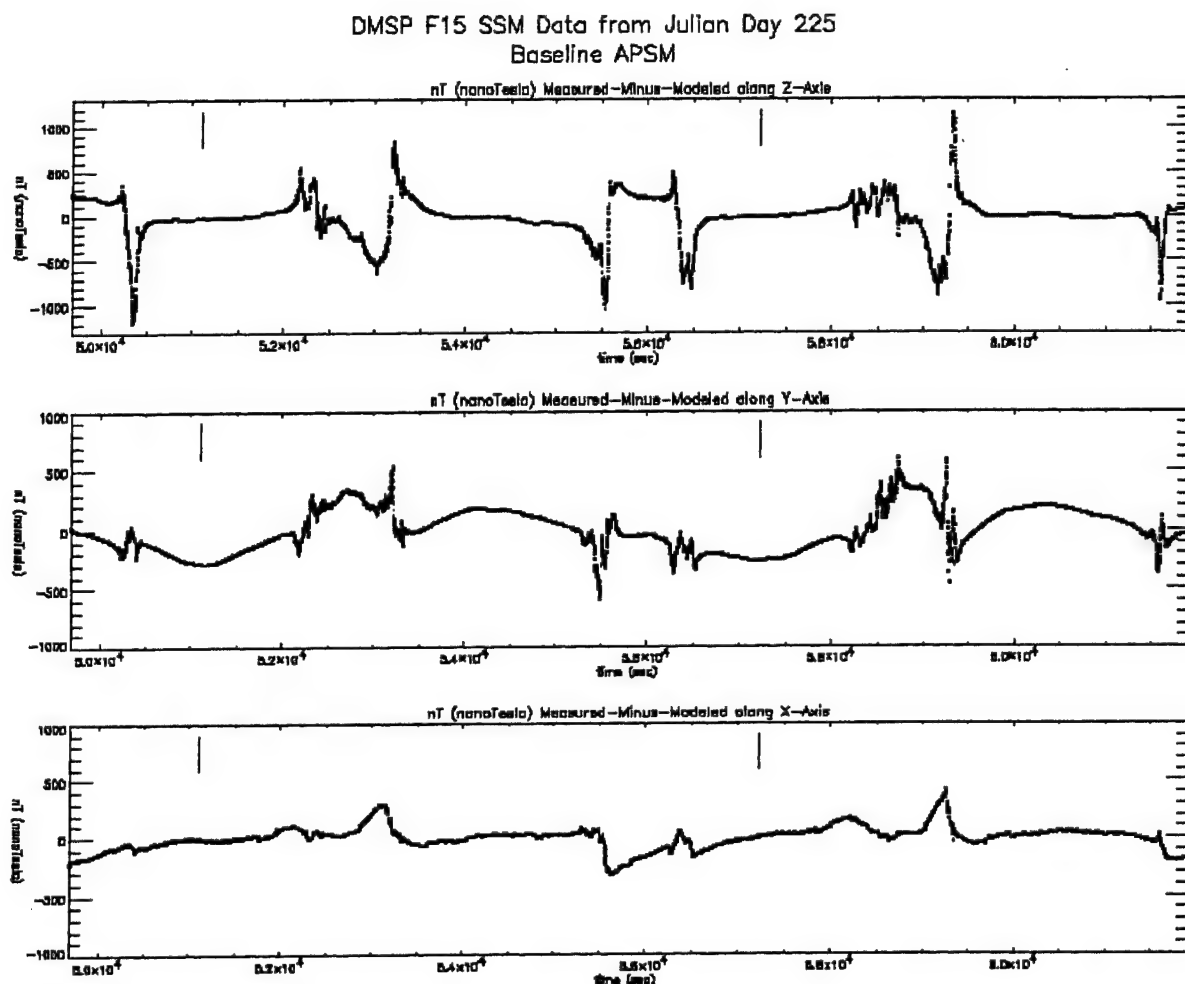


Figure 10. Active Day Calibrated Measured-Minus-Modeled Data.

The active plot from Day 2000-046 displays much more activity than does the quiet plot from Day 2000-032. This difference is most pronounced in the Z-curves and least noticeable in the X-curves. The disruptions appear in the auroral zones, whereas the curves in the non-auroral regions remain smooth.

Figure 11 shows four orbits of very quiet measured-minus-modeled data from a non-Z wave day, all three dimensions, output range minimal. Hanging vertical ticks near the top of the box around each axis plot indicate ascending nodes of the satellite orbit.

DMSP F15 SSM Data from Julian Day 076
Baseline APSM

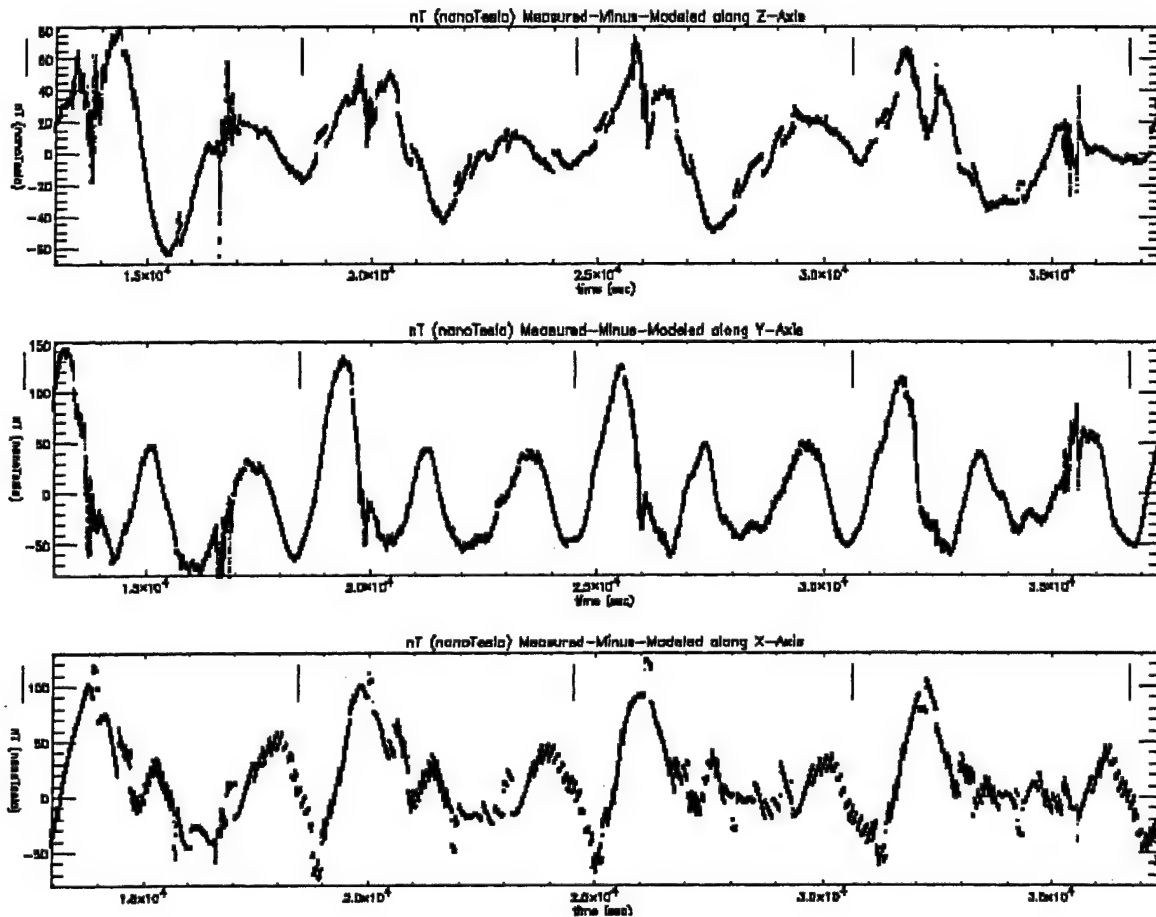


Figure 11. Remaining Difference in the Measured-Minus-Modeled Field.

The last plot in Figure 11 contains four orbits of very quiet data from Day 2000-076. This plot appears noisier than the other two, since it is magnified about 8 times relative to the other two. This magnification shows the sinusoidal waves still present in this plot. Most sinusoids are contained in the ranges of:

- 80 to 130 nT for the X-axis
- 80 to 150 nT for the Y-axis
- 80 to 80 nT for the Z-axis

3.2 Remaining Equipment Operation Induced Step Field Jumps

While the movement of the sensor from body-mounting to the end of a 5m boom greatly reduced the number of equipment operation induced step field jumps in the data, a few remain. In the X (down) axis, 30nT jumps of duration 150-450 seconds can be seen, with similar 10nT jumps visible in the Z (orbit normal). These jumps appear infrequently or typically two to four times per orbit. These artifacts are not removed because any removal algorithm would be likely to also remove portions of auroral activity.

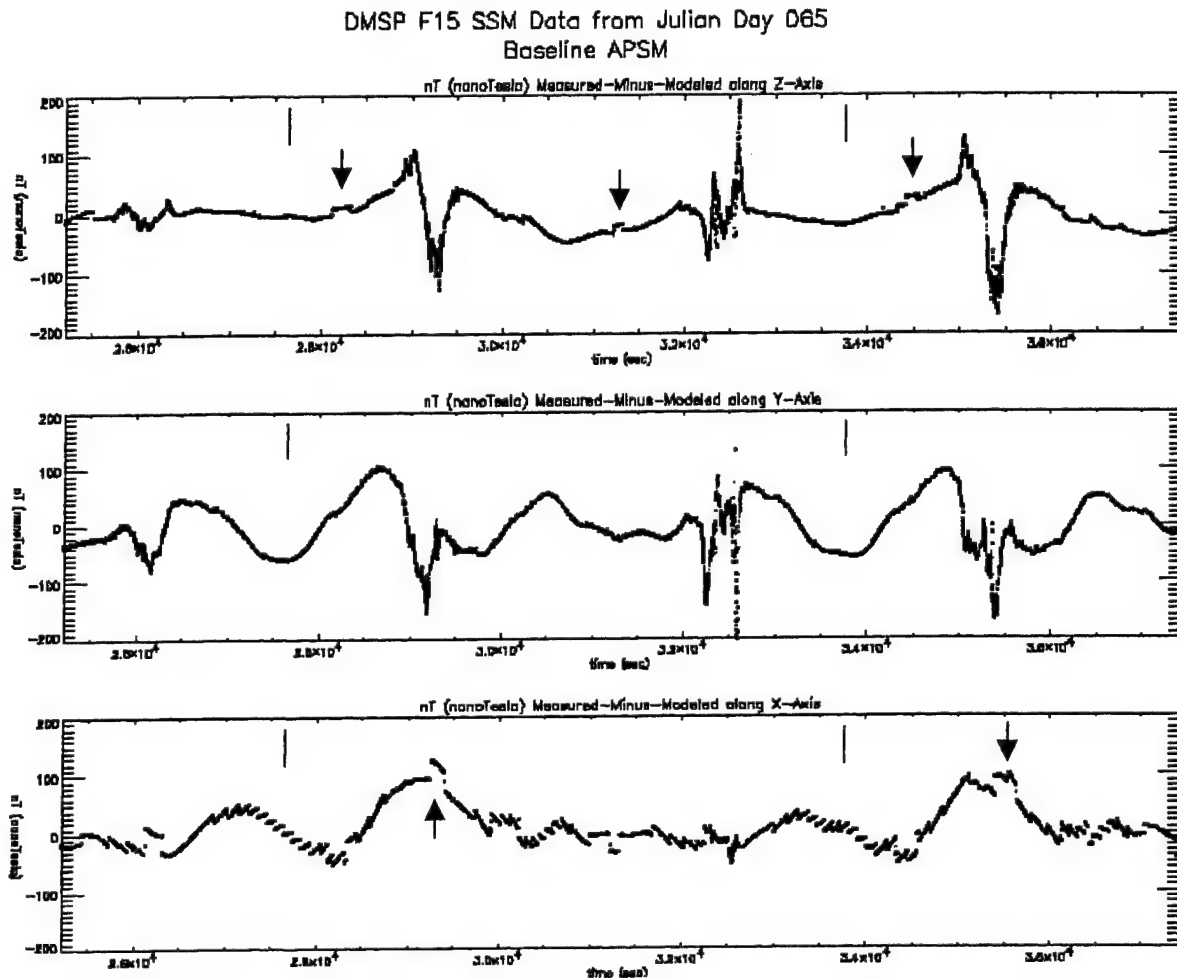


Figure 12. Remaining Equipment Operation Induced Step Field Jumps.

The vertical lines hanging just below the top of each chart box indicate time of the ascending node.

3.3 Sinusoid In The Orbit Normal (Z) Dimension

The curves for Days 2000-005, 2000-008, 2000-010, 2000-016, 2000-017, 2000-018, 2000-021, 2000-031, 2000-047, 2000-136, and 2000-163 exhibit a sine wave in the Z-dimension. For most days the average period of a Z-wave is 3060 seconds, but for Days 2000-005, 2000-136, and 2000-163 it is 3170, 3070, and 3050, respectively. Thus each period lasts approximately half an orbit.

However, in the last part of Days 2000-047 and 2000-136, the wave suddenly flattens out at $T=57600$ and $T=67600$, respectively. Hence it is, in general, very easy to remove mathematically, but for Days 2000-047 and 2000-136 its removal is somewhat harder.

3.3.1 Most Wavy-Flat Boundaries Are Sudden

In most cases the Z-wave undergoes a sudden change when crossing midnight UT. However, exceptions occur in "adjacent-to-wavy" Days 2000-004, 2000-011, 2000-015, 2000-030, 2000-046, 2000-048, 2000-135, and 137, of which the last four correspond to the anomalous wavy days 047 and 136. Even with these exceptions, the correspondence of the boundaries of the wave amplitudes to the boundaries of the data files is cause for concern.

Table 3 lists the behavior of the wave between each "wavy" day listed in Section 3.3 above and the days adjacent to it. All days are from the year 2000.

| TABLE 3. Transition Behavior of the Z-Wave Across Day/File Boundaries | | |
|--|---|---|
| Wavy Day | Day Before | Day After |
| 005 | 004 is wavy like 005 | wave suddenly disappears when it crosses from 005 to 006 |
| 008 | wave suddenly appears when it crosses from 007 to 008 | wave suddenly shrinks in amplitude when it crosses from 008 to 009 |
| 010 | wave suddenly grows in amplitude when it crosses from 009 to 010 | 011 starts with data gap until UT=11,800, when a flat Z-curve appears |
| 016 | large data gap at the end of 015, wave reappears in full strength at start of 016 | (017 is also wavy) |
| 017 | (016 is also wavy) | (018 is also wavy) |
| 018 | (017 is also wavy) | wave suddenly shrinks in amplitude when it crosses from 018 to 019 |
| 021 | wave suddenly grows when from 020 to 021 | wave suddenly shrinks from 021 to 022 |
| 031 | wave GRADUALLY grows from 030 to 031 | wave suddenly shrinks from 031 to 032 |
| 047 | wave suddenly appears as choppy at UT=70,000 of Day 046, then becomes smooth (but amplitude remains large) when it enters 047. Through 047, wave steadily grows in amplitude until it suddenly becomes flat at UT=57,600. | wave suddenly loses its flatness from 047 to 048 |
| 136 | wave is flat until UT=71,500 of Day 135, wave gains amplitude. At Day 136, UT=67,600, wave suddenly becomes flat again. | wave stays flat through 137 |
| 163 | wave suddenly appears when it crosses from 162 to 163 | wave suddenly disappears when it crosses from 163 to 164 |

The plot in Figure 13 depicts the last two orbits of Day 2000-031 and the first two orbits of 2000-032, both of which show Z-waves. The Z-wave undergoes a sudden shrinkage from a total height of about 315nT on Day 2000-031 to only 160nT on Day 2000-032, where the total height is the average distance in nT from the peak of a wave to its bottom. The plot shows that the total height gradually settles down in the interval from 86400 and 88600 seconds UT, or 2200 seconds into Day 2000-032, to the smaller wave of 2000-032.

Left half of plot belongs to Day 031
 Right half of plot belongs to Day 032; subtract 86400 from UT here

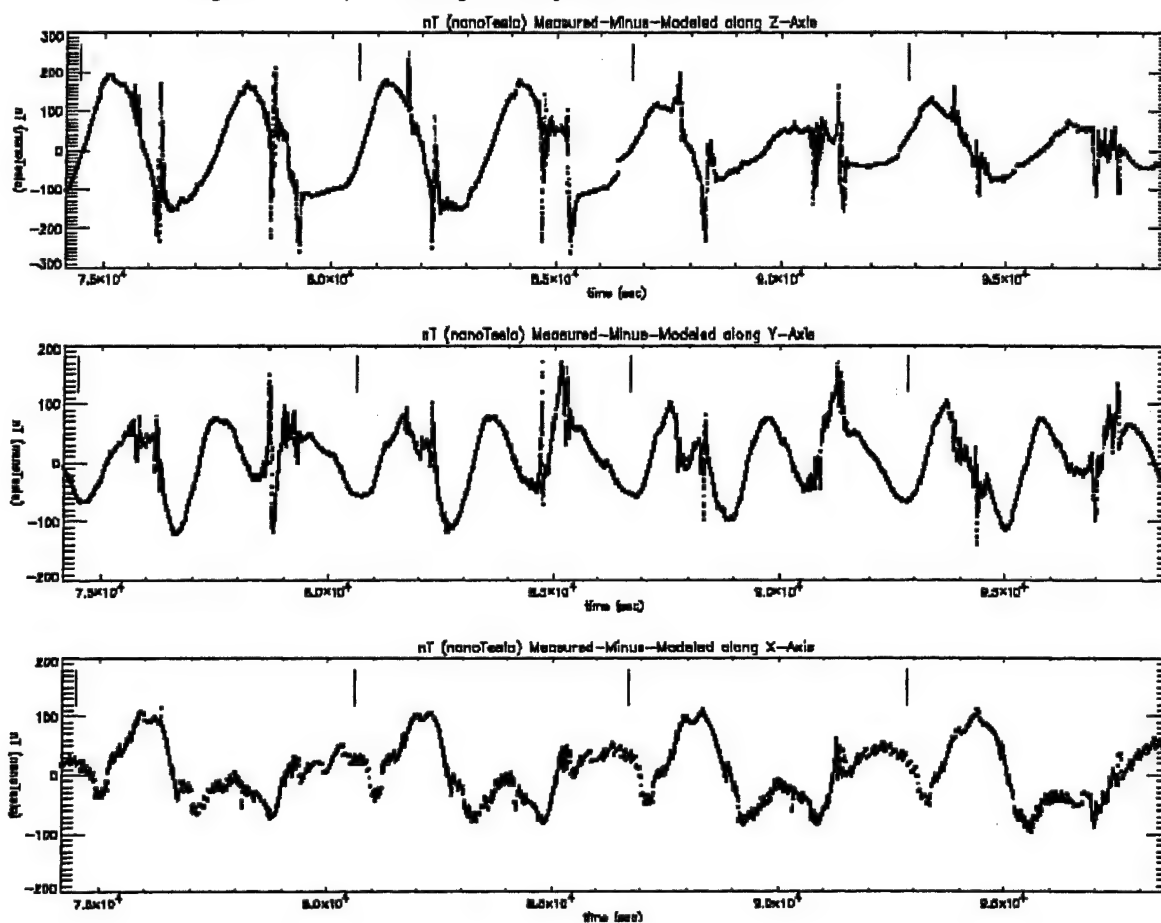


Figure 13. The Z-Wave Crossing Midnight.

3.3.2 Relationship Between Z and X/Y

As with the Z axis, sinusoidal waves can be observed in the X and Y axes.

For each wavy day, the average peak amplitude is tabulated in Table 4, estimated to the nearest 10 nT. Those about halfway between two 10's of nT are listed to the nearest 5 nT. In addition, the average magnitudes of the wave trough (bottom of curve) and crest (curve top) are listed, thus portraying the average vertical wave shift from 0 nT. The peak amplitudes of the X and Y curves are added below.

| TABLE 4. Comparative Wave Amplitudes in Z vs. X & Y | | | | | |
|---|-------------|------------|------------|-------------|-------------|
| Day | Z Avg. peak | Z Avg. min | Z Avg. max | X Avg. peak | Y Avg. peak |
| 005-2000 | 280 | -290 | 260 | 60 | 95 |
| 008-2000 | 250 | -260 | 240 | 60 | 85 |
| 010-2000 | 235 | -240 | 230 | 55 | 90 |
| 016-2000 | 270 | -280 | 265 | 60 | 90 |
| 017-2000 | 150 | -150 | 150 | 55 | 80 |
| 018-2000 | 160 | -160 | 160 | 55 | 80 |
| 021-2000 | 165 | -160 | 170 | 60 | 75 |
| 031-2000 | 160 | -160 | 160 | 60 | 80 |
| 047-2000 | 300 | -250 | 340 | 60 | 85 |
| 136-2000 | 155 | -110 | 240 | 70 | 105 |
| 163-2000 | 150 | -140 | 160 | 40 | 80 |

For a set of sample days, the Y-wave has much less amplitude than the Z-wave, and is always 1.5 times as frequent as the Z-wave. Moreover, waves Y and Z are 90 degrees out of phase except in Day 136, in which they are in phase or 180 degrees out of phase. At the vertical lines that mark the ascending nodes (crossing the equator going north), the Y-wave always hits a minimum. Here the Z-wave is halfway up its rise, except that it is halfway down its drop on Days 046 and 047 and at its minimum on Day 136.

The amplitude of the X-wave is so small that its peaks are hard to discern. However, its frequency equals that of the Y-wave. The X-wave lags a bit behind the Y-wave, since at the ascending nodes where the Y-wave hits a minimum, the X-wave has almost reached its minimum.

The amplitudes of the waves X and Y are just as high for the non-wave days as they are for the wavy days. Thus the amplitudes for X and Y are independent of the Z-amplitude. Based on these observations, it is believed that the effects of the Z-wave are limited to that axis, and the sinusoids in the X and Y are unrelated.

3.3.3 X and Y Waves Are Not Created by Calibration

For each of the above days, the contribution of the calibration matrices from the Z-axis to axes X and Y is defined as the first two components of the 3x1 vector:

$$ORTHO * \begin{bmatrix} 0 \\ 0 \\ Z \end{bmatrix} = \begin{bmatrix} ORTHO(1,1) & ORTHO(1,2) & ORTHO(1,3) \\ ORTHO(2,1) & ORTHO(2,2) & ORTHO(2,3) \\ ORTHO(3,1) & ORTHO(3,2) & ORTHO(3,3) \end{bmatrix} * \begin{bmatrix} 0 \\ 0 \\ Z \end{bmatrix} = \begin{bmatrix} ORTHO(1,3) * Z \\ ORTHO(2,3) * Z \\ ORTHO(3,3) * Z \end{bmatrix} \quad (7)$$

where Z = average maximum amplitude of Z-wave, in nT. Thus, the X and Y contributions are respectively $ORTHO(1,3)*Z$ and $ORTHO(2,3)*Z$. Since ORTHO is very close to the identity matrix, the contributions from Z to X and Y are very small compared to the actual observed peaks in the X and Y axes. Similarly, the ORTHO matrix for non-auroral points is also close to the identity matrix and thus, its contributions are also small. We can conclude that the X and Y waves are NOT due to calibration matrices.

3.4 Sawtooth In The Down (X) Dimension

The X-curve contains frequent regions of sawteeth phenomena overlaying the measured-minus-modeled field curves in all 28 days of sample data examined. These sawteeth are noticeable as a series of parallel lines and are often aligned perpendicular to the flow of the curve. Close examination shows these lines to be the result of a series of the following pattern: gradual linear increases in the measured-minus-modeled field, followed by a discontinuity where the field drops back to a baseline and begins to ramp up again.

NOTE: Even the Sections without "sawteeth" are NOT composed of one continuous curve. They also have sawteeth, except theirs are much longer, less regular in period and amplitude, and run along the curve flow. The discontinuities between long sawteeth are real, since the MFR files show discontinuities in the X-field at these breaks. Thus, the long sawteeth are a mathematical fact. Moreover, the long sawteeth are regular sawteeth, although the X-curve exhibits other discontinuities.

Subsections 3.4.1 through 3.4.6 are limited to short sawteeth.

The following plot, in Figure 14, of the X-curve of Day 004-2000 shows a typical series of sawteeth.

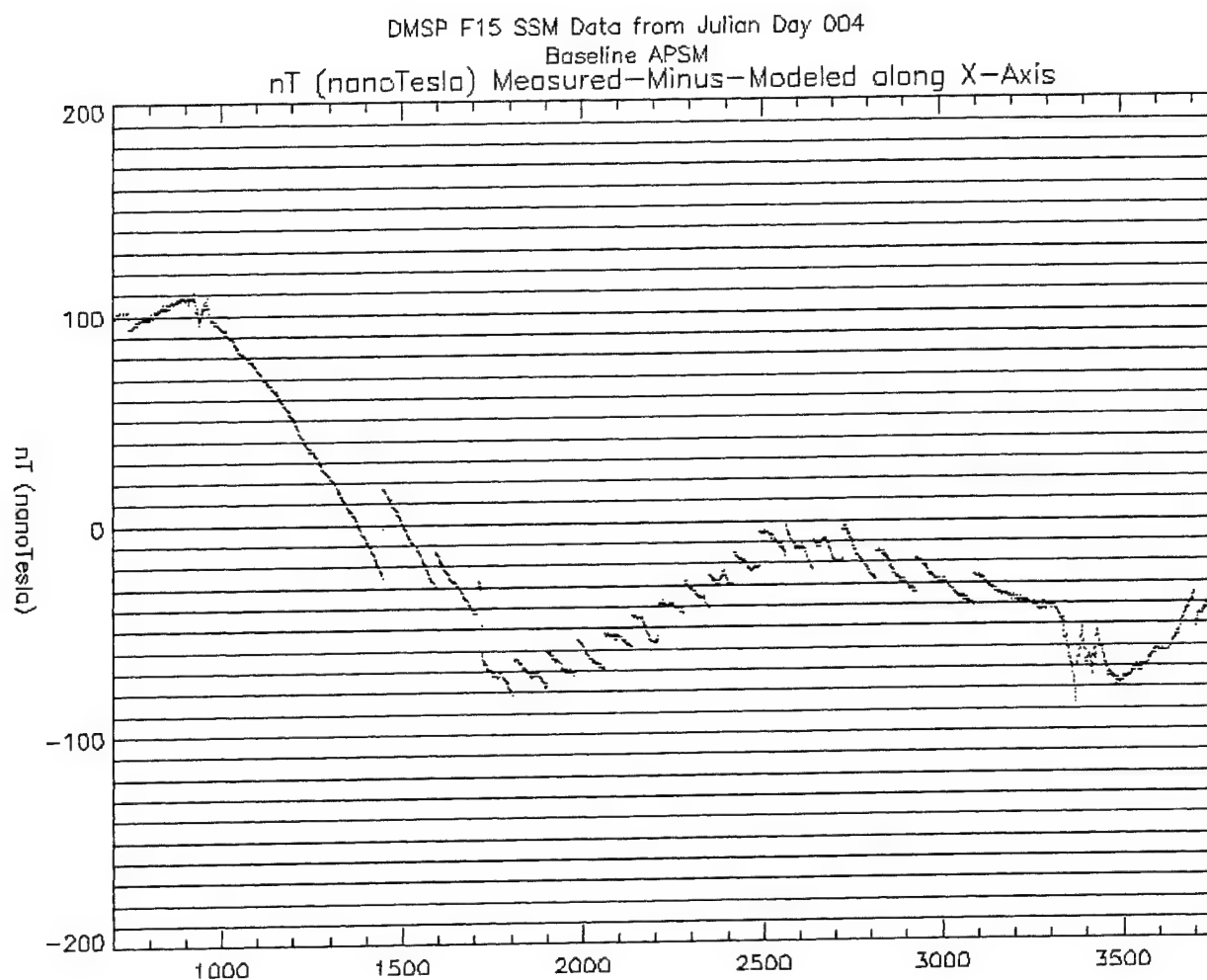


Figure 14. The X Sawtooth.

3.4.1 Height of the X-Sawtooth Phenomena

The amplitude range or height of the discontinuity of an average-sized sawtooth is about 12 nT. However, this height varies widely from one sawtooth to another. Over the 28 sample days, the discontinuity ranges from indiscernible to 30 nT. Such a sawtooth with amplitude 30nT was found at UT=54500 on Day 2000-010.

3.4.2 Period of the X-Sawtooth Phenomena

The average period or duration of a sawtooth cycle is about 100 seconds, although this period is only 70 to 80 seconds on some segments of the curve.

Areas of high-period or spaced far apart, low-amplitude sawteeth appear in the middle of some short-curve zones. These zones are more likely to span over long time intervals (such as 1500 seconds) as opposed to short intervals (700 seconds), and to span larger ranges of amplitude,

than other zones. In addition, the high-period, low-amplitude sawteeth are more likely to appear within 5 degrees of the equator than are the surrounding sawteeth, and are less regular and far less frequent.

3.4.3 Latitudinal Distribution of the X-Sawtooth Phenomena

About 55 percent of the X measured-minus-modeled curve lies in the sawtooth region, which corresponds to the latitudes shown in Table 5. These latitudes are derived from Seconds 0-20000 UT of sample days 2000-004 and 2000-047, and Seconds 48000-68000 of sample day 2000-163.

| TABLE 5. Latitudinal Distribution of the X-Sawtooth | | | | | |
|---|-------------------------|-----------------------------|--------|---------------------------|--------|
| Day | Number of sample region | Geographic latitude (deg N) | | Magnetic latitude (deg N) | |
| | | Starting | Ending | Starting | Ending |
| 2000-004 | 1 | 37 | -40 | 30 | -53 |
| | 2 | -54 | 32 | -40 | 44 |
| | 3 | 38 | -40 | 32 | -53 |
| | 4 | -77 | 33 | -61 | 43 |
| | 5 | 38 | -34 | 32 | -45 |
| | 6 | -56 | 37 | -43 | 42 |
| 2000-047 | 7 | 53 | -44 | 46 | -58 |
| | 8 | -70 | 30 | -55 | 42 |
| | 9 | 38 | -44 | 32 | -56 |
| | 10 | -47 | 29 | -32 | 39 |
| | 11 | 54 | -40 | 49 | -49 |
| | 12 | -44 | 31 | -35 | 36 |
| 2000-163 | 13 | -36 | 39 | -48 | 32 |
| | 14 | 44 | -70 | 54 | -58 |
| | 15 | -30 | 37 | -42 | 32 |
| | 16 | -24 | 35 | -35 | 29 |
| | 17 | -45 | 33 | -52 | 26 |

Each of the 17 regions charted above crosses the equator, spanning typically between -45 and 45 degrees N, for both geographic and magnetic latitudes. Thus, the sawteeth seem to occur in the non-auroral regions of the satellite orbit. Except for region 16, the satellite direction alternates between northbound and southbound.

3.4.4 Sawteeth Cross Day and File Boundaries

There are plenty of examples of sawteeth crossing between files (i.e. two consecutive days):

- Days 005-006 (the 2 stripes on the 005 side at 0-20 nT continue on the 006 side with 1 stripe at 0-10 nT, before abrupt drop to -30 nT that begins a zone of many stripes)
- Days 006-007
- Days 009-010

- Days 016-017
- Days 020-021
- Days 021-022
- Days 030-031 (with abrupt rise of 25 nT from 030 side to 031 side)
- Days 031-032
- Days 046-047 (the stripes here are very short in length)
- Days 136-137 (only 2 stripes appear on the 136 side; they average 15 nT above the next few stripes on the 137 side)

No examples of sawteeth beginning on one side of midnight UT and ceasing at the day/file boundary were observed.

3.4.5 Sawteeth in the Z-Curve, but Not the Y-Curve

Close-up plots of the Y-curve do NOT reveal any sawteeth. However, close-ups of the Z-curve do reveal telltale parallel lines in some places, but not nearly as often as on the X-curve. Nor are the several consecutive “teeth” that conclusively demonstrate the artificiality of the X-sawteeth visible.

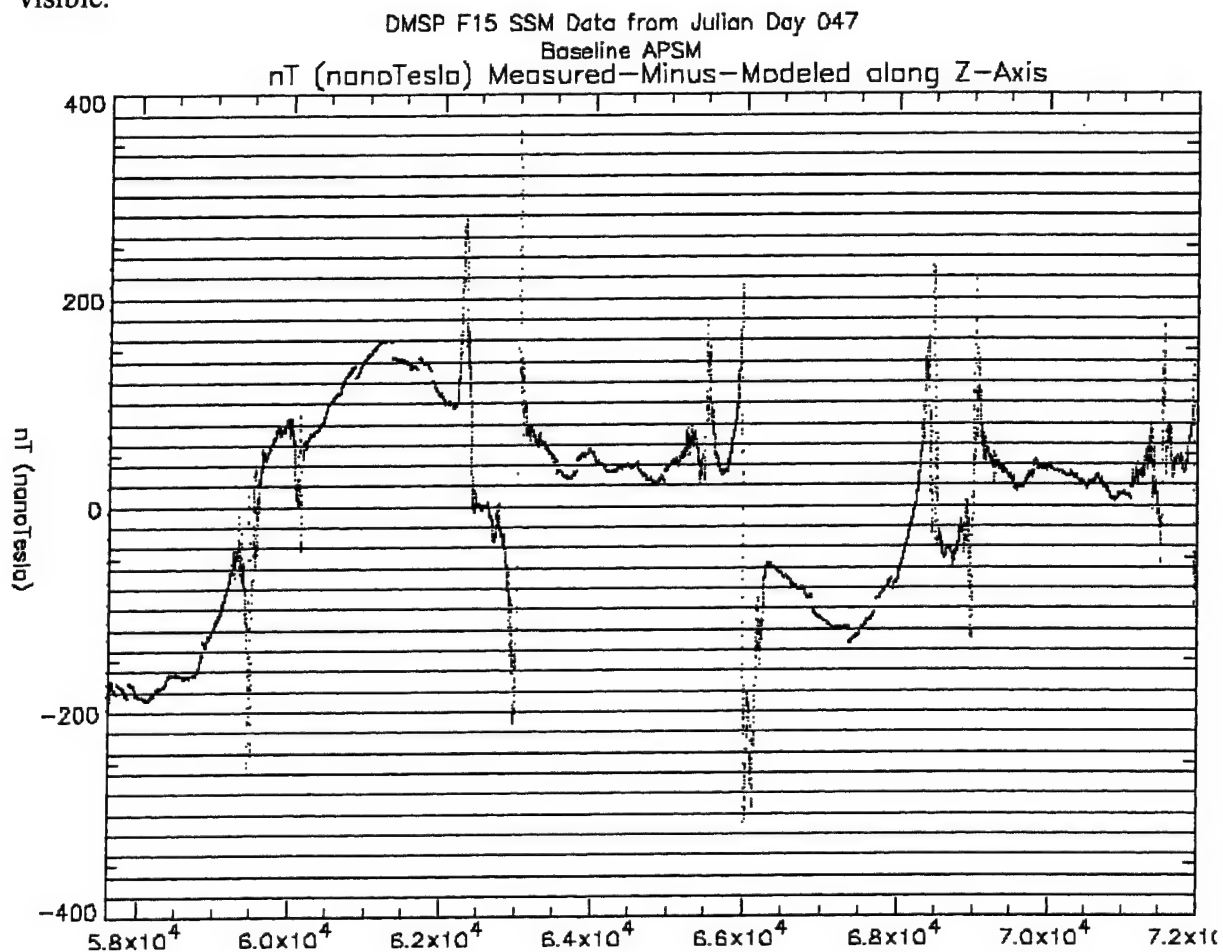


Figure 15. Some Sawteeth in the Z Curve.

These 3 parallel lines, which do NOT continue onto the previous plot, are real sawteeth. Their amplitudes average 14nT and their periods 114 seconds. During their 341sec interval from 57,631sec UT to 57,972sec UT, the geographic latitude of the satellite drops from approximately 22.6deg N to 2.6deg N, and its magnetic latitude from 32.3deg N to 11.1deg N. Although they do not correspond to any sawtooth effect in the X-axis, they form the largest number of consecutive short sawteeth in a sample collection of Z-curve plots for Days 004-2000, 047-2000, and 163-2000. However, these three days contain numerous examples of long "sawteeth".

3.5 Time-Phase Calibration Study

This study investigates whether the remaining curves in the quiet measured-minus-modeled field are due to a constant time error resulting in out-of-phase magnetic fields.

The TLEs provide the track of the spacecraft, the series of its positions over time. For each position, the modeled field is calculable. However, if there is an error in the time of the orbit or in the time with which the measurements are tagged, the cumulative error means that while the measured and modeled fields are correct, they are correct for two different times. Comparison of these two out-of-phase fields results in an error, a measured-minus-modeled (MMM) field difference. Hence not only would the in-flight calibration not calibrate (correct) for such an error, but also that error would bias, and limit the ability of, the calibration to correct for the error it is designed to fix (gain, cross-talk, and change in model field). Examinations of the calibrated MMM data have shown periodic errors that are approximately in the range that a 1.0-second phase error between the measured and modeled field might cause.

SSM calibration depends on making a best fit of measured magnetic field to modeled field. This best fit depends not only on the size of their resulting MMM difference, but also on the number and amplitudes of periodic functions in the MMM field. The smaller these quantities, the more easily these functions can be removed, thereby revealing the source and amount of error.

A metric of these quantities is the average of the absolute value of the MMM value, abbreviated AAVMMM, both overall (Magnitude) and in each dimension (X, Y, and Z). While it is hoped that any improvements in the "flatness" of the MMM field will be graphically evident, this numerical metric is useful to indicate whether an attempted phase correction marginally improves the quality of the MMM field. If no constant phase correction could be found, this metric would be useful to ensure that the search was complete rather than missing a potentially effective correction value. For a given day, the optimal time correction has the smallest maximal peaks of the MMM plot and the lowest Magnitude AAVMMM. Similarly, the optimal correction for the X-dimension has the lowest X-value of AAVMMM and preferably the smallest maximal peaks in the X-axis. The same holds true for the Y-dimension and for the Z-dimension.

3.5.1 Method

For a given period of data, the time for which the model field is calculated is varied by a constant value. This change has the affect of calculating a model field for earlier or later in the orbit. The measured-minus-modeled field is then examined to determine whether this phase shift in the model field has caused it to align with the measured field. Since the issue in question limits the existing calibration, a new calibration must be performed on each of the phase-shifted results to truly see whether the induced phase shift has resulted in an improvement or not.

For a given day, starting with a zero correction ($T=0$), different values of the correction T are used until a value of T with minimum Magnitude AAVMMM is arrived at. Each value of T is added to or subtracted from the time variable $TTIME$ passed from Subroutine `APSM_READ_RAW_CONVERT_TO_MEAS` to Subroutine `APSM_CREPH`. For example, for $T = -0.5$, the last line before the call to `APSM_CREPH` is set to:

$TTIME = TTIME - 0.5$

Day 2000-076 from times 12300 to 42900 seconds UT has been chosen, being a very quiet span of a very quiet day, and thus, free of factors that could disturb the experiment. This time span covers exactly five orbits based on an average orbit length of 6120 seconds. Five orbits are enough to see the cyclical errors in MMM without introducing date-dependent issues. The extremely quiet data and the integer number of orbits preclude latitudinal bias. Care taken that no TLE lies inside this span, so that if there is an ephemeris time error, it has a better chance of remaining constant over the period studied.

3.5.2 Results

For Day 2000-076, Table 6 lists the correction values T and the Magnitude, X , Y , and Z values of AAVMMM for each T . It is noteworthy that the post-recalibration plots vary little in appearance with the value of T . In fact, the plots for T between 0.75 and 1.0 are nearly indistinguishable. Thus, the AAVMMM, but not the curve shape, is used.

| TABLE 6. Results of Attempted Correction of Hypothetical Time-Phase Error | | | | |
|---|--------------------|--------|--------|--------|
| T (sec) | AAVMMM values (nT) | | | |
| | Magnitude | X | Y | Z |
| -100.0 | 776.12 | 415.05 | 497.43 | 203.88 |
| -20.0 | 170.80 | 88.04 | 116.31 | 43.01 |
| -10.0 | 103.74 | 50.71 | 73.99 | 25.31 |
| -4.0 | 70.05 | 31.03 | 51.92 | 17.62 |
| -3.0 | 65.53 | 28.28 | 48.72 | 16.89 |
| -2.0 | 61.57 | 25.94 | 45.75 | 16.41 |
| -1.5 | 59.85 | 25.03 | 44.35 | 16.26 |
| -1.0 | 58.34 | 24.39 | 43.03 | 16.15 |
| -0.5 | 57.06 | 24.11 | 41.84 | 16.11 |
| 0.0 | 56.09 | 24.13 | 40.80 | 16.12 |
| 0.5 | 55.45 | 24.40 | 39.91 | 16.18 |
| 0.75 | 55.30 | 24.64 | 39.56 | 16.24 |
| 0.85 | 55.28 | 24.75 | 39.44 | 16.27 |
| 0.9 | 55.27 | 24.82 | 39.38 | 16.28 |
| 0.95 | 55.28 | 24.88 | 39.34 | 16.30 |
| 1.0 | 55.29 | 24.95 | 39.30 | 16.32 |
| 1.1 | 55.32 | 25.10 | 39.25 | 16.35 |
| 1.5 | 55.68 | 25.78 | 39.22 | 16.55 |
| 2.0 | 56.56 | 26.82 | 39.43 | 16.86 |
| 3.0 | 59.34 | 29.34 | 40.61 | 17.61 |
| 4.0 | 63.00 | 32.21 | 42.26 | 18.60 |
| 10.0 | 94.33 | 52.50 | 58.62 | 26.93 |
| 20.0 | 161.17 | 90.15 | 98.06 | 44.86 |
| 100.0 | 764.51 | 417.32 | 474.04 | 208.75 |

This table indicates that the optimal correction for the Magnitude AAVMMM is $T=0.9$. In fact, the trend in the above results for high values of T show that $T=0.9$ is the only optimal value.

As an example of the effect of the optimal correction on the MMM, the plots shown in Figures 16 and 17 contrast the Y-curve of the MMM at $T=0$ (Figure 16) to the Y-curve at $T=1.4$ (Figure 17) where the Y-axis AAVMMM is lowest.

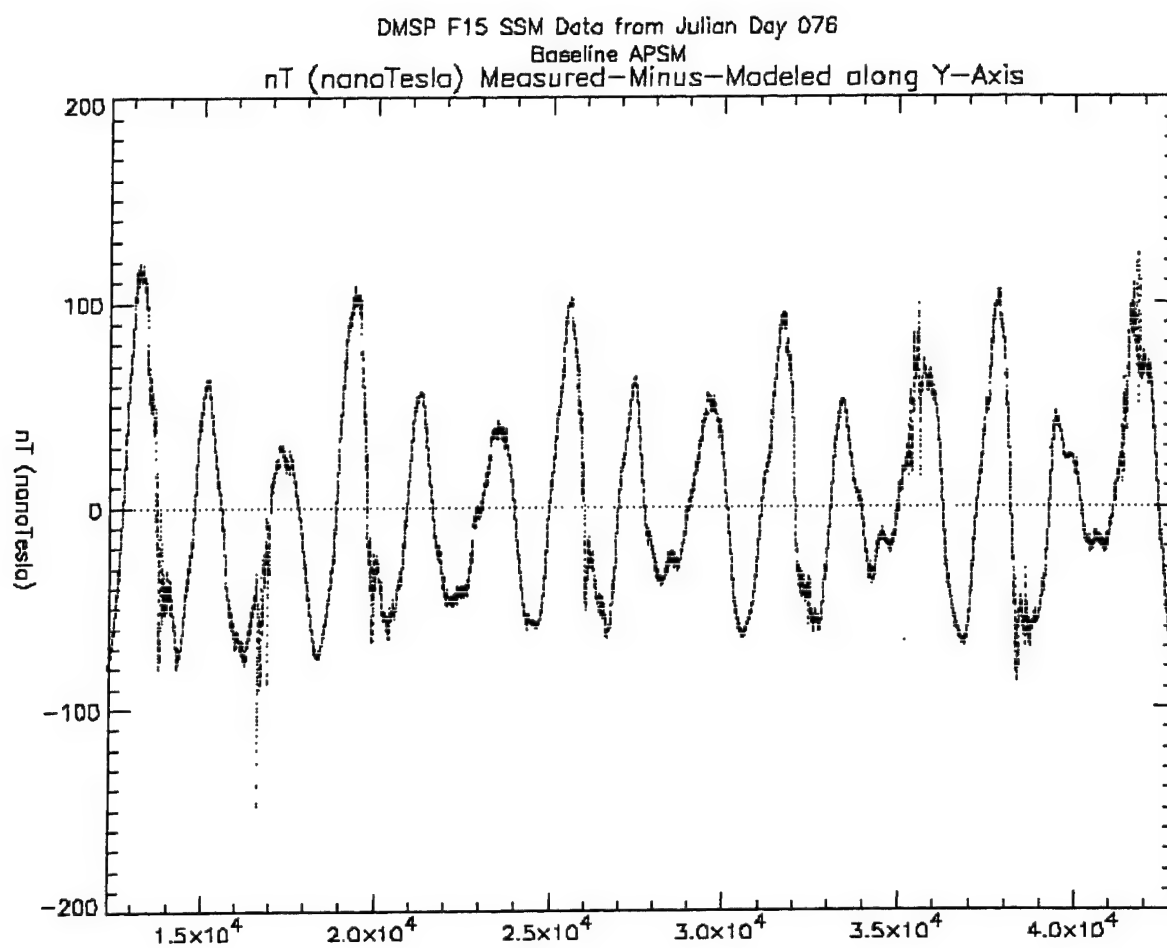


Figure 16. Y-Curve Without Corrective Time-Phase Shift.

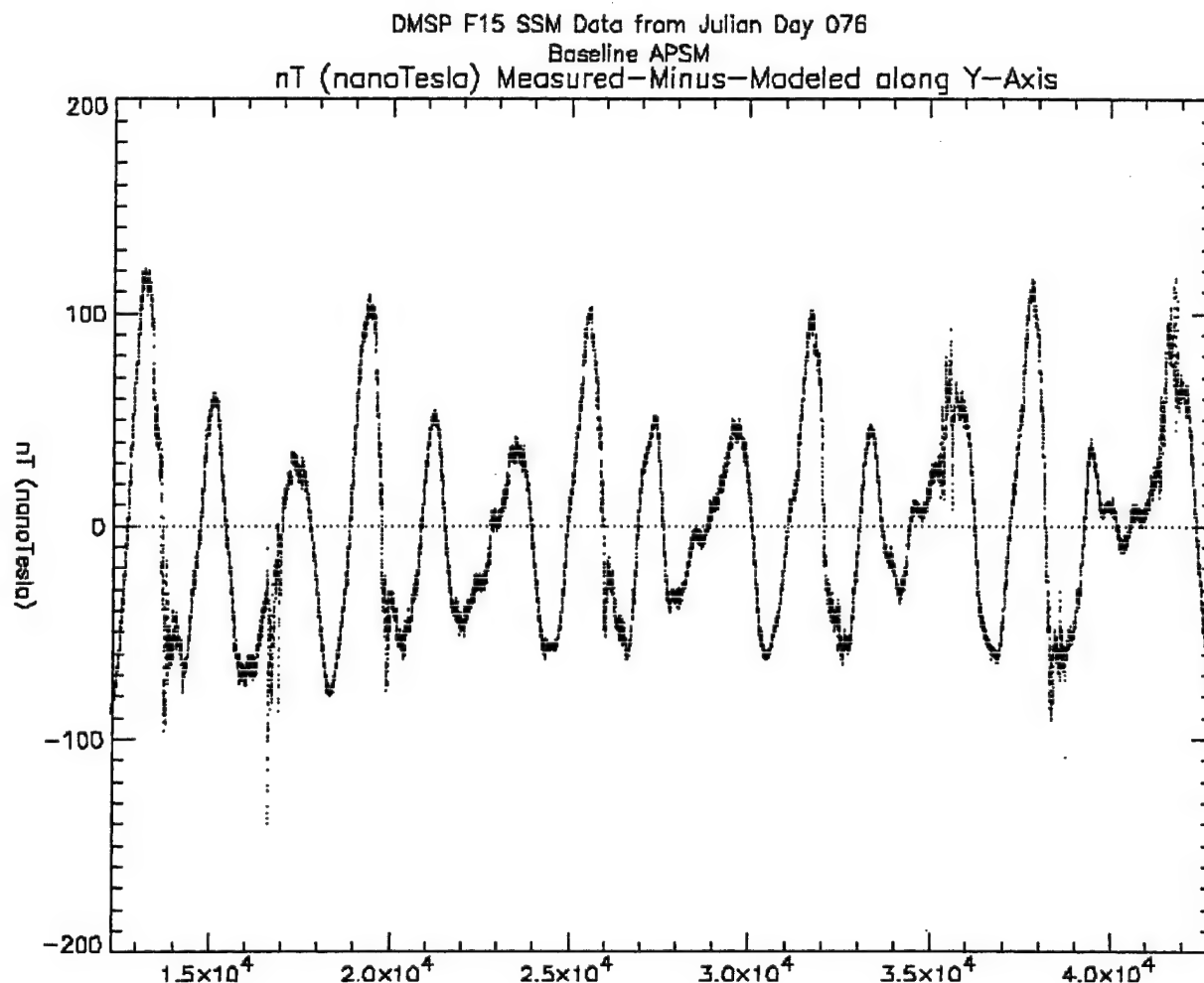


Figure 17. Y Curve with Best Corrective Time-Phase Shift.

Both curves look similar, but contrary to expectation, the largest peaks in the plot for $T=1.4$ are in general slightly *bigger* than those of $T=0$. This effect underscores the unreliability of optimizing T based on the largest peaks in the plot.

It was hoped that finding this T would reduce the Magnitude AAVMMM enough and/or remove one of the periodic functions of error, making it easier for the remaining functions to be removed. However, this time correction does not bring the Magnitude AAVMMM close to zero. Moreover, the minimum Magnitude AAVMMM of 55.27 is not much less than for the time corrections immediately around it. This finding (together with the nearly unchanging appearance of curves near $T=0.9$) reveals that still other errors remain, perhaps never to be corrected, and suggests that a time correction is NOT the proper solution. Its cause is that even for the optimal $T=0.9$ that brings the measured and modeled curves closest together, their exact shapes are different enough to keep the Magnitude AAVMMM up at 55.27. Similarly, for the individual components X, Y, and Z, the lowest amounts of AAVMMM are approximately 24, 39, and 16,

respectively, indicating that the Z-error is less than the errors of X and Y. These minimums occur at $T = -0.325$, 1.4 , and -0.325 , respectively.

Whereas the time-error analysis of Day 2000-076 is started using the definitive early calibration, the analysis of Days 2000-164 and 2000-221 are started with the definitive late calibration. It was hoped that the correction $T=0.9$ would be the same for Day 2000-164. However, the minimum Magnitude AAVMMM error occurs at $T=1.15$, not 0.9 . Similarly, for Day 2000-221 the minimum Magnitude AAVMMM is $T=1.425$. Thus, the solution $T=0.9$ does not seem to generalize to other days; each day has its own optimal correction time.

The shift in minimum Magnitude AAVMMM from $T=0.9$ on Day 2000-076 to $T=1.15$ on Day 2000-164 is $1.15-0.9=0.25$. Since the AAVMMM minimums for X, Y, and Z on Day 2000-164 are 0.05 , 1.825 , and 0.025 , respectively, their shifts are 0.375 , 0.425 , and 0.35 , respectively. Thus, the Magnitude-AAVMMM shift of 0.25 does NOT hold for the AAVMMM minimums X, Y, and Z. Similarly, the AAVMMM minimums for X, Y, and Z on Day 2000-221 are 0.15 , 1.9 , and -0.125 , respectively. Therefore, the shifts in minimum AAVMMM from Day 2000-076 to Day 2000-221 are 0.475 , 0.5 , 0.2 , and 0.525 for X, Y, Z, and overall Magnitude, respectively, and are thus unequal.

Moreover, no pattern of results is readily visible that is consistent across the three days 2000-076, 2000-164, and 2000-221, making it difficult to track and remove the proper amount of time error across many days of data. All results for the above three sample days are tabulated in Tables 7 and 8. Furthermore, the day , 2000-164, and 2000-221 "best" correction times still had little impact upon the measured-minus-modeled field.

| TABLE 7. Best Corrective Time-Phase Shifts for Various Days and Dimensions | | | | |
|--|--------------------------------|-------|--------|-----------|
| Day Number | Optimal Correction Times (sec) | | | |
| | X | Y | Z | Magnitude |
| 2000-076 | -0.325 | 1.4 | -0.325 | 0.9 |
| 2000-164 | 0.05 | 1.825 | 0.025 | 1.15 |
| 2000-221 | 0.15 | 1.9 | -0.125 | 1.425 |

| TABLE 8. Comparison of Best Corrective Time-Phase Shifts | | | | |
|--|--------------|-------|------|-----------|
| Day Number | Shifts (sec) | | | |
| | X | Y | Z | Magnitude |
| 2000-164 | 0.375 | 0.425 | 0.35 | 0.25 |
| 2000-221 | 0.475 | 0.5 | 0.2 | 0.525 |

3.5.3 Conclusions

Examinations of the calibrated MMM data have shown periodic errors that are approximately in the range that a 1.0-second phase error between the measured and modeled field might cause.

For Day 2000-076, and most likely in general, the optimal correction T does not bring AAVMMM close to zero. In addition, the minimum AAVMMM is not much less than for the time corrections immediately around it. Moreover, when T is near the optimal value, the curves vary little with T. All of the findings in this paragraph reveal that still other errors remain, perhaps never to be corrected, and suggest that a time correction is NOT the proper solution.

Each of the three sample data days 2000-076, 2000-164, and 2000-221 has a unique optimal correction time T for each value (X, Y, Z, Magnitude) of AAVMMM. However, these times vary from one day to another. In addition, no pattern of results is readily visible that is consistent across the three days, making it difficult to track and remove the proper amount of time error across many days of data.

3.6 IGRF Versus Ørsted Coefficients

The Danish satellite, Ørsted, was launched on 02/23/1999. The main goal of its mission is to accurately map the magnetic field of the Earth. Magnetic field model coefficients were proposed based on the Ørsted measurements [Olsen, *et al.*, 2000].

This study compares the modeled field and other results of current IGRF-2000 coefficients that have been used in APSM, with similar results of a new set of field coefficients derived from Ørsted data, as reported in Olsen, *et al.* [2000]. Each set of coefficients is the spherical harmonic coefficients for the internal magnetic field of the Earth. The change in coefficients significantly affects the MMM field and calibration-correction matrices, but not the modeled field and AAVMMM values. AAVMMM is defined above in Section 3.5.

The above results are consistent with Olsen, *et al.* [2000], Page 3609, which indicates that the difference in the IGRF-2000 and Ørsted models of secular variation (SV) of the field is negligible.

3.6.1 Method

The IGRF and Ørsted models were run through APSM for Day 2000-006. This day was picked as a quiet day close to January 1, 2000 for which little data is missing. Closeness to January 1 is needed since the analysis in the Ørsted article does not include dB/dt coefficients, but calculates the field coefficients based on a "snapshot" of the modeled field near January 1.

For each run of APSM, the correct set of coefficients was loaded into arrays G and GT of the INCLUDE file APSM_IGRF_2000.INC. Here the array G contains the coefficients for the modeled field, while GT represents the change in modeled field with respect to time. The letter

“T” in “GT” stands for “Time derivative.” The template needed to rearrange the Ørsted coefficients into APSM_IGRF_2000.INC is derived from NOAA [1999].

3.6.2 Results

The calibration-correction matrices from the early calibration to T_0 and AAVMMM values from the T_0 -calibrated run are listed below for IGRF and Ørsted. Their (Ørsted - IGRF) differences are also computed here. The matrices and table in Section 3.6.4 below and the two GIF images “mod_orst.gif” and “mmm_orst.gif” show that the change in coefficients has little effect on the modeled field and AAVMMM values. The images in Figures 18 and 19 show the difference between the two modeled fields (Ørsted - IGRF) and the two MMM fields (Ørsted - IGRF), respectively.

These results agree with *Olsen, et al.* [2000], Page 3609, which indicates that the difference in the IGRF-2000 and Ørsted models of secular variation (SV) of the field is negligible.

However, the above change affects the calibration-correction matrices, and the MMM field. This effect is not much smaller than the magnitude of the MMM field itself.

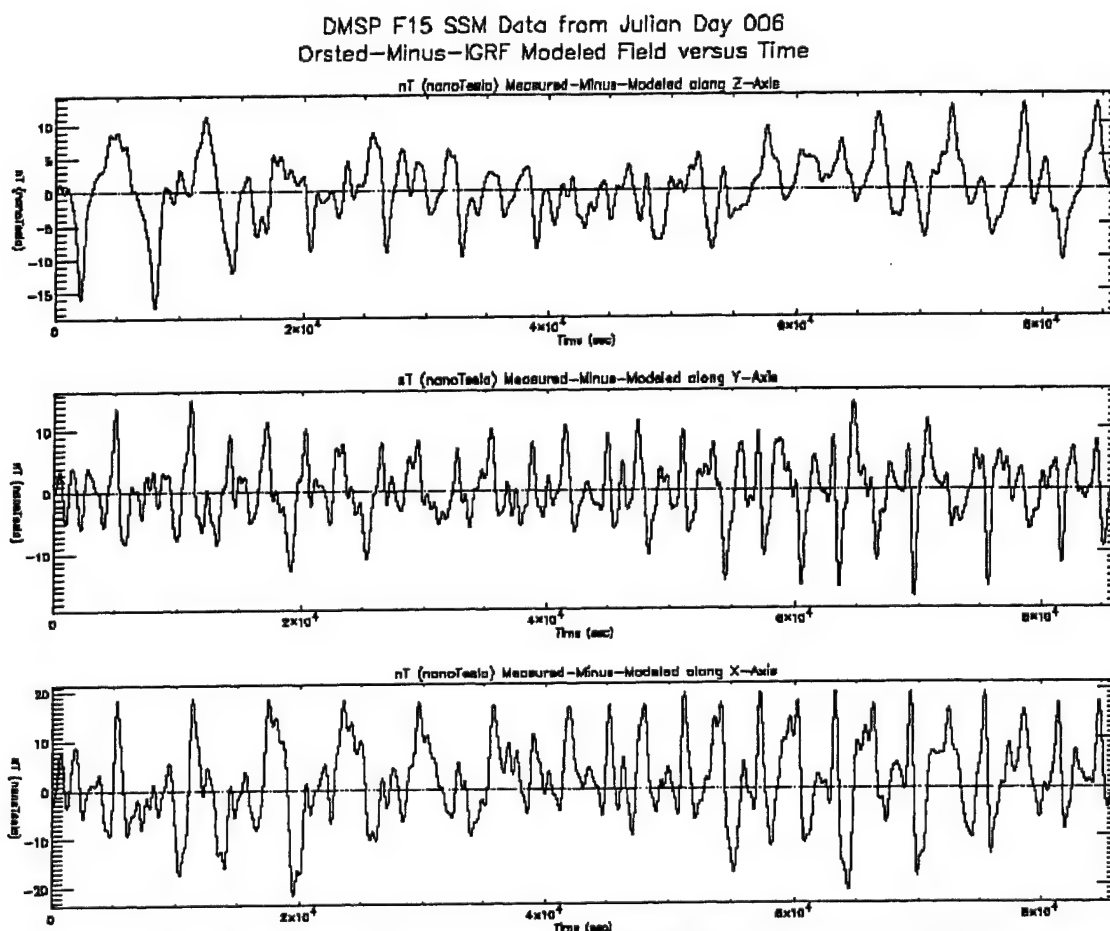
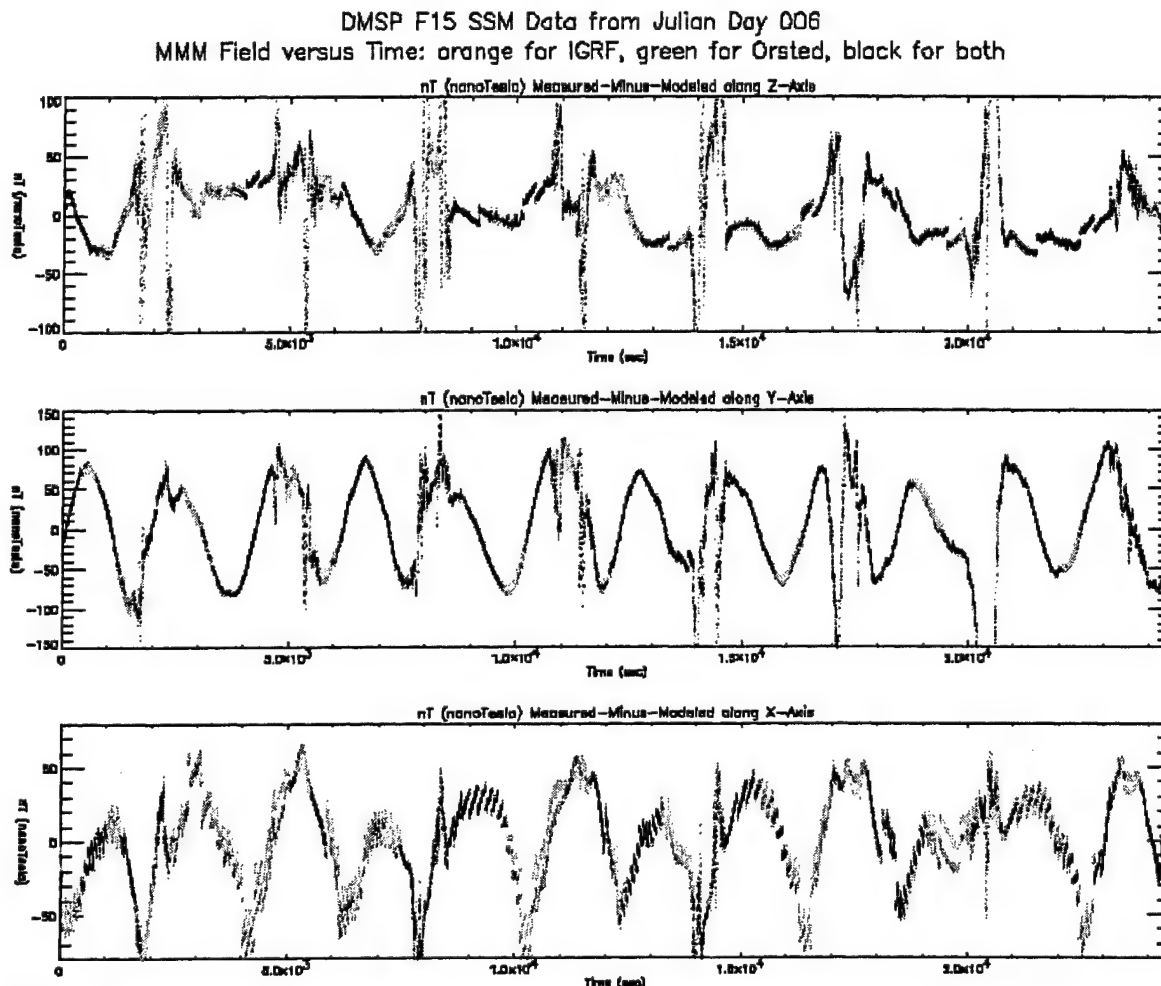


Figure 18. Difference Between Ørsted and IGRF2000 Geomagnetic Field Models.

The first ascending node for the above plot occurs at approximately 3739 seconds UT.



The first ascending node for the above plot occurs at approximately 3739 seconds UT.

3.6.3 The Effect of dB/dt Coefficients

All of the above comparisons were repeated between the IGRF and “zero” models, where the zero model is derived from the IGRF model by setting all values in the array GT to zero. The zero model is used only to test that the effect of GT from January 1 to January 6 (Day 006) is trivial. Hence, the (zero - IGRF) differences should be tiny, which the matrices and Table 9 in Section 3.6.4 below and the GIF images “mod_zero.gif” and “mmm_zero.gif” indeed verify.

It is noteworthy that except for “mmm_zero.gif”, all GIF images contain periodic sinusoidal functions in all three axes.

3.6.4 Calibration-Correction Matrices for Ørsted vs. IGRF 2000 Models

The following matrices show the correction from the final early calibration of Section 2.5, to a calibration based only on data from day 2000-006 using the Ørsted model, with no clipping.

| | ORTHO | | OFFSET |
|-------------|-------------|------------|--------|
| Ørsted | | | |
| 0.99933847 | -0.00082232 | 0.00075014 | 13.54 |
| 0.00061829 | 1.00001383 | 0.00296111 | 11.43 |
| -0.00035633 | -0.00064480 | 0.99583765 | -23.24 |

The following matrices show the correction from the final early calibration of Section 2.5, to a calibration based only on data from day 2000-006 using the IGRF 2000 model, with no clipping.

| | | | |
|-------------|-------------|------------|--------|
| IGRF | | | |
| 0.99924934 | -0.00077048 | 0.00185994 | 21.71 |
| 0.00054233 | 0.99993498 | 0.00231638 | 7.34 |
| -0.00032003 | -0.00064058 | 0.99683187 | -17.37 |

The following matrices show the correction from the “Ørsted” calibration above, to a calibration based only on data from day 2000-006 using the IGRF 2000 model, with no clipping.

| | | | |
|-----------------|-------------|-------------|-------|
| (Ørsted - IGRF) | | | |
| 0.00008913 | -0.00005184 | -0.00110980 | -8.17 |
| 0.00007596 | 0.00007885 | 0.00064473 | 4.09 |
| -0.00003630 | -0.00000422 | -0.00099422 | -5.87 |

The following matrices show the correction from the final early calibration of Section 2.5, to a calibration based only on data from day 2000-006 using the IGRF 2000 model without dB/dt coefficients, with no clipping.

| | | | |
|-------------|-------------|------------|--------|
| zero | | | |
| 0.99926032 | -0.00077154 | 0.00191388 | 22.27 |
| 0.00054307 | 0.99993883 | 0.00232613 | 7.37 |
| -0.00031608 | -0.00064096 | 0.99682911 | -17.58 |

The following matrices show the correction from the above “zero” calibration, to a calibration based only on data from day 2000-006 using the IGRF 2000 model with dB/dt coefficients, with no clipping.

(zero - IGRF)

| | | | |
|------------|-------------|-------------|-------|
| 0.00001098 | -0.00000106 | 0.00005394 | 0.56 |
| 0.00000074 | 0.00000385 | 0.00000975 | 0.03 |
| 0.00000395 | -0.00000038 | -0.00000276 | -0.21 |

TABLE 9. Affect of Different Calibrations Derived From Ørsted vs. IGRF 2000 Models

| AAVMMM (nT) | Coefficient Set or Difference | | | | |
|----------------|-------------------------------|-------|--------------------|-------|---------------|
| | Ørsted | IGRF | (Ørsted - IGRF) | zero | (zero - IGRF) |
| X | 21.60 | 23.44 | -1.88 | 23.49 | 0.05 |
| Y | 45.88 | 46.10 | -0.22 | 46.10 | 0 |
| Z | 23.80 | 23.12 | 0.68 | 23.15 | 0.03 |
| Magnitude | 63.68 | 64.72 | -1.04 | 64.76 | 0.04 |

4. THE SEARCH FOR BOOM-RELATED ARTIFACTS

This report is a follow-up to previous experiments with the Special-Sensor Magnetometer (SSM) boom on the F15 satellite as written in *Cook, et al.* [1997]. For background information see [Cook, et al., 1997].

After the F15 satellite was launched, real data sets became available. The purpose of this Section is to analyze the effects of adding the F15 boom on real data. This analysis aims to find out whether or not the results of *Cook, et al.* [1997] hold for the real data sets, and to reveal what factors exert the greatest influence on the output measured-minus-modeled amounts of magnetic-field intensity. These factors are listed below in Section 4.8.1.

An additional study attempts to express the effect of adding the boom as the sum of three factors that could twist the boom. These three factors are continual oscillation, sun-induced thermal twist, and impulse twist. Section 4.9 details this study.

Once the contributions of the three factors are hypothesized, they can be subtracted out of the estimated **baseline** curve to get the true baseline curve, which is the difference between the measured and modeled fields when no error is present due to a twist of the F15 boom. Then factors other than the actual field, including artifacts, can be subtracted from the measured field. In this way, one can calculate a more accurate field for all purposes.

4.1 Purpose Of The Boom

This Section addresses why the F15 sensor was placed on a boom, the potential problems with this placement, and how to address these problems.

Ionospheric magnetic field measurements are used to support Department of Defense meteorological forecasting and geophysical research projects. The SSM sensor mounted aboard the DMSP vehicles measures magnetic field vectors at the satellite. This measurement is theoretically composed solely of the ionospheric and geomagnetic fields; in reality, the electrical equipment aboard the satellite provides an additional source of magnetic fields when operating. To avoid this interference, the SSM sensor sits upon a 5m (16.25ft) boom beginning with DMSP F15. As the strength of the interfering magnetic fields varies inversely with the cube of the distance from the sensor, it is hoped that the use of this boom will result in substantial reduction of the interference. Hence, the purpose of the boom-mounted SSM is to significantly decrease the magnetic field changes and jumps generated by the satellite equipment, particularly the artificial jumps found in the F14 plots.

Launched Sunday 12/12/1999 at 12:38 EST, DMSP F15 carries a boom-mounted SSM sensor.

In most F15 data, there are no visually observed errors in the data that compare in magnitude to those induced by the spacecraft's field upon the measurements of the body-mounted instrument. See Section 3 for a discussion of the intermittent and small errors observed in the data.

4.2 Potential Problem With The Boom

However, the boom has its potential disadvantages.

The basic calibration method of Section 2 above can be applied to the body-mounted SSMs of DMSP F12 through DMSP F14, since they are orientated along the sensor axes parallel ($\pm 0.5^\circ$) to the spacecraft axes of Down, Motion, and Orbit Normal. The sensor is relatively rigid with respect to the spacecraft body, and thus, the position information of the satellite closely matches the SSM ephemeris.

However, the boom on the DMSP F15 satellite is potentially subject to oscillation through various forces, such as the heat of the Sun. By placing the F15 sensor on this possibly less rigid boom, its orientation might not be predicted as simply as before. An initial look at the data after in-flight calibration reveals that any boom-movement effects are small compared to those errors normally removed by the in-flight calibration.

4.3 Simulating Boom Oscillation

The studies in Sections 4.6, 4.7, and 4.8 of this report simulate possible errors induced by this new sensor placement. Hopefully, by simulating the likely errors, their size and shape can be found out, thereby helping to differentiate them from natural activity. This report studies three potential errors: continual oscillation, thermal, and impulse. However, there may be other errors not effectively simulated by these errors.

These three errors are simple to simulate. They also encompass a wide range of error types, since each error is applied under conditions different from the other two errors. In particular, the continual oscillation is the same for the entire orbit. However, the angle of thermal twist fluctuates as the satellite moves through its orbit, and the impulse twist occurs only when the satellite crosses the equator or the day-night terminator.

4.3.1 Simulation and Effects of a Continual Orientation Error

If the orientation of the placement of the body-mounted SSM has only an accuracy of $\pm 0.5^\circ$, as stated in Section 4.2 above and in Cook, *et al.* [1997], then one can assume that the orientation of the boom-mounted sensor will vary considerably more from the spacecraft axes. This continual error can be simulated by rotating the measured vectors from various days of SSM data by small angles (1.0°) about the three sensor axes. This error can be corrected in the same manner as the body-mounted orientation error.

4.3.2 Simulation and Effects of a Varying Orientation Error

While the boom is not likely to be twisting in the wind or bent down by its weight, it will alternate between day and night zones in the course of an orbit. This process of heating and cooling may be enough to torque the boom, changing the orientation of the sensor.

To simplify the simulation, the terminators for this sun-synchronous satellite were previously approximated at its maximum and minimum latitudes (southbound by day, northbound by night). However, because of the axial tilt of the Earth, the satellite does not cross between day and night at its southern and northern peaks, as illustrated Figure 20, for (say) December 22. Hence, this approximation of the terminator crossings was imprecise and thus removed.

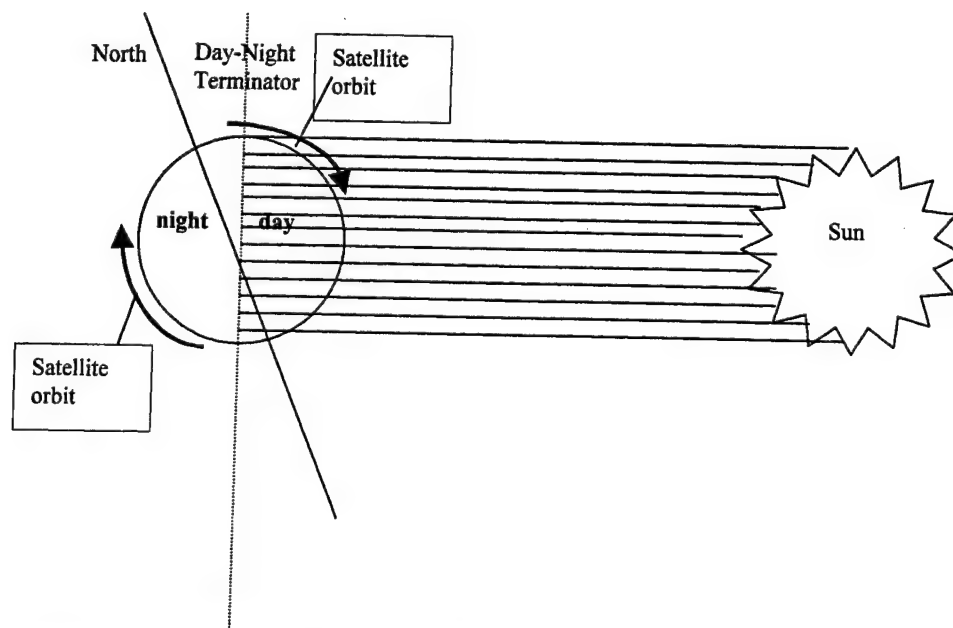


Figure 20. Effect of Earth's Axial Tilt on Day/Night Terminator at Altitude.

The thermal and impulse twists, the latter introduced in Section 4.3.3 below, at the day-night crossings instead of at the peak latitudes.

In addition, the sensor is assumed to rotate about all three axes because of the effect of the solar heating. As the satellite passes into "day," the sensor begins to twist, reaching a maximum twist as it crosses the day-night terminator, and then untwisting on the night side, reaching the original untwisted position as it crosses into day again. The maximum twist angle in all three dimensions is set to 2.5 degrees. No residual vibratory effects are modeled.

4.3.3 Simulation and Effects of a Damped Impulse Error

An impulse effect that might possibly occur to disturb the boom is the operation of the torquing motor. Such an impulse disturbance would be quickly damped out by the mechanical damping system in the boom assembly. This error is modeled by applying an instantaneous twist of 2.5deg about all three of the sensor axes, and then reducing that twist as a function of time so that the twist is reduced by 98 percent in 30 seconds. To show its varying impact, this error is applied at each crossing of the day-night terminator and the equator.

4.4 Model Used To Produce The Simulation Data Plots

This Section describes the mathematical model used to simulate the above three error types.

4.4.1 The Model Equation

The calibration for F14 exhibited a constant angular error and offset, as characterized in the ORTHO and OFFSET calibration matrices in the equation below that is copied from Section 3.1.

$[B_{true}] = [ORTHO] * [B] + [OFFSET]$; that is,

$$\begin{bmatrix} B_{x_true} \\ B_{y_true} \\ B_{z_true} \end{bmatrix} = \begin{bmatrix} ORTHO_{11} & ORTHO_{12} & ORTHO_{13} \\ ORTHO_{21} & ORTHO_{22} & ORTHO_{23} \\ ORTHO_{31} & ORTHO_{32} & ORTHO_{33} \end{bmatrix} \begin{bmatrix} B_x \\ B_y \\ B_z \end{bmatrix} + \begin{bmatrix} OFFSET_x \\ OFFSET_y \\ OFFSET_z \end{bmatrix}, \text{ where :} \quad (8)$$

$[B_{true}]$ = the calibrated magnetic field,

$[B]$ = the measured magnetic field before calibration, and

$[ORTHO]$ and $[OFFSET]$ are the calibration matrices

However, for F15, any additional contribution to the offset error should be minimal at the end of the boom. This contribution is easy to remove despite interference from other factors.

Therefore, our model ignores the offset and addresses only angular error. In other words, it sets OFFSET in the above equation to the 3x1 zero vector to form the equation below:

$[B_{true}] = [ORTHO] * [B]$ that is,

$$\begin{bmatrix} B_{x_true} \\ B_{y_true} \\ B_{z_true} \end{bmatrix} = \begin{bmatrix} ORTHO_{11} & ORTHO_{12} & ORTHO_{13} \\ ORTHO_{21} & ORTHO_{22} & ORTHO_{23} \\ ORTHO_{31} & ORTHO_{32} & ORTHO_{33} \end{bmatrix} \begin{bmatrix} B_x \\ B_y \\ B_z \end{bmatrix}. \quad (9)$$

The angular error due to the boom is divided into three types. Each error type is a twist in the boom. This twist is applied by multiplying each 3x1 measured magnetic field vector BMEAS, one for each time interval, by a 3x3 matrix ROTAT to obtain BTEMP. ROTAT rotates BMEAS in three dimensions, using three angles A, B, and C, as in the equation below. Here we changed the notation of the matrix and vectors from $[B_{true}]$, $[ORTHO]$, and $[B]$ to $[BTEMP]$, $[ROTAT]$, and $[BMEAS]$, respectively. The former quantities pertain to the calibration; the latter simulate boom rotation.

$$\begin{bmatrix} BTEMP_x \\ BTEMP_y \\ BTEMP_z \end{bmatrix} = [ROTAT] * \begin{bmatrix} BMEAS_x \\ BMEAS_y \\ BMEAS_z \end{bmatrix}. \quad (10)$$

$[ROTAT]$ is the product of the three rotation matrices $R_A R_B R_C$, where

$$R_A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & cA & sA \\ 0 & -sA & cA \end{bmatrix}, \quad R_B = \begin{bmatrix} cB & 0 & -sB \\ 0 & 1 & 0 \\ sB & 0 & cB \end{bmatrix}, \quad R_C = \begin{bmatrix} cC & sC & 0 \\ -sC & cC & 0 \\ 0 & 0 & 1 \end{bmatrix}. \quad (11)$$

Here, cA, cB, and cC are shorthand for $\cos(A\pi/180)$, $\cos(B\pi/180)$, and $\cos(C\pi/180)$, respectively. sA, sB, and sC are shorthand for $\sin(A\pi/180)$, $\sin(B\pi/180)$, and $\sin(C\pi/180)$, respectively. The $\pi/180$ adjustment is due the fact that A, B, and C measure degrees, not radians.

Each BMEAS vector is read out of one temporary file. Each new record, including the BTEMP vectors, is copied to a second temporary file. After all computations are performed, the second temporary file is copied back into the first one for the next subroutine.

4.4.2 Algorithms that Simulate the Twist Types

To implement the three errors, a version of APSM was modified to include the following additional subroutines for testing purposes: APSM_OSCILLATION for continual oscillation, APSM_THERMAL for heat-induced oscillation, and APSM_IMPULSE for rotation due to damped impulses. Each of these subroutines can be either turned on or disabled by commenting

out its call in the main routine of APSM. Each subroutine contains one or more parameters that can be easily adjusted.

4.4.2.1 Continual Twist

The simplest error is continual oscillation, controlled by Subroutine APSM_OSCILLATION. Misalignment causes this oscillation, in which the boom is rotated by a three-dimensional rotation matrix by three angles, A, B, and C, in the YZ, XZ, and XY planes, respectively. As the oscillation is continual, the boom is assumed to remain in its rotated position throughout the day of each prefile run through APSM. Hence, this matrix is applied to every 3x1 field vector. Subroutine APSM_OSCILLATION controls A, B, and C.

4.4.2.2 Thermal Twist

Run by Subroutine APSM_THERMAL, thermal oscillation potentially arises from sun-induced heating and cooling of the boom and its resulting flexing. This rotation matrix varies over time, with the three rotation angles equal at all times. These angles are equal to the maximum (PMAX) as the satellite crosses from day to night, and to zero while crossing from night to day. In between crossings, the angles vary linearly between zero and PMAX. The parameter PMAX can be set to different values, typically 2.5 or 5 degrees.

4.4.2.3 Impulse Twist

The final type of twist is a single impulse, controlled by Subroutine APSM_IMPULSE, that begins each time the satellite crosses the day-night terminator or the equator. The impulse starts at the maximum angle PMAX, which in our experiment is typically 2.5 or 5 degrees. Over the next minute, it is exponentially damped according to the following equation:

$$\text{IMPULSE} = \text{PMAX} * \exp(-\text{ALPHA} * s),$$

where $\text{ALPHA} = \ln(50)/30$, the factor that reduces the impulse by 1/50 after 30 seconds, and "s" is the number of seconds that elapsed since the start of the impulse. All three rotation angles are equal to IMPULSE, which is zero for most 3x1 field vectors.

4.4.3 Jump Removal

All jump removal routines were in use during the entire experiment to eliminate jumps and noise as factors, other than the three twist types, that are contained in the "boom minus non-boom" field difference.

4.5 Rules Of The Analysis Of Boom Effects

The following rules are observed throughout this experiment:

The direction of increasing numbers on the X-axis is assumed to be downward. Similarly, the Y-axis points in the direction of motion of the satellite. The Z-axis points in the orbit-normal direction.

To save memory space, all output plot files are produced in GIF format rather than in PostScript.

4.5.1 Sample Data Used

In Section 4.9, another set of data days from the Boston College prefiles for F15 was processed through APSM, this time using the TLE ephemeris instead of the ephemeris interwoven in the Boston-College prefiles. The TLE ephemeris is more accurate, and it could be expected to limit its error to a consistent amount.

The following six sample days were chosen, since they are equidistant and span most of the days represented in the TLEs of the file DMSP_TLE_FILE.TXT. This span was enough to determine whether or not calibration drift, which causes the continual twist to move over several months, was present. For improved precision, all six days were late enough so that no near-launch orbital perturbations or adjustments would occur. However, this range of less than 6 months of data is possibly insufficient to allow for the observation of potential seasonal variation.

Day 2000-050 (02/19/2000)

Day 2000-083 (03/23)

Day 2000-116 (04/25)

Day 2000-149 (05/28)

Day 2000-182 (06/30)

Day 2000-215 (08/02)

4.5.2 Why Body-Mounted and Boom-Mounted SSM Data Can Not be Compared

The F15 sensor sits on a boom, whereas the F14 sensor does not. Thus, it is tempting to treat the F15 data as the field measured on the boom, and the F14 non-boom measurements as a model of the field without the boom. Hence, it seems that one can use $(F15 - F14)$ as the difference due to the boom.

Unfortunately, at a given time, these two satellites are generally in different positions. Hence, their modeled fields $F15_{\text{mod}}$ and $F14_{\text{mod}}$ at these positions are different, so that subtracting them will not provide a meaningful comparison. Similarly, their measured fields $F15_{\text{meas}}$ and $F14_{\text{meas}}$ can not be compared. Neither can their measured-minus-modeled differences $(F15_{\text{meas}} - F15_{\text{mod}})$ and $(F14_{\text{meas}} - F14_{\text{mod}})$ be compared, since the direction of the vector (x, y, z) of measured-minus-modeled difference depends on the latitude and longitude of the satellite. By the time one

spacecraft is in a comparable position to an earlier position of the second spacecraft, the field will have changed due to day/night and other time-dependent considerations.

Even the field-versus-latitude plots can not use the (F15 - F14) differences, since at a given latitude the two satellites generally occupy different longitudes, rendering it meaningless to compare F15 with F14.

Furthermore, the major difference between the boom and body-mounted measurements is a positive one; the accuracy of the body-mounted measurements is considerably impaired by the spacecrafts' fields, and with the potential boom-dependent errors visually observed to be less than the effect of the spacecrafts' fields, the body-mounted sensors have insufficient precision for the desired comparisons.

Hence, this experiment does not utilize data from body-mounted SSMs.

4.5.3 Definition of the Boom Effect

The effect of adding the boom is defined by subtracting the magnetic field based on a model of the magnetic field of the Earth, from the field (strength) that F15 measures. In other words, the boom effect is set equal to $(F15_{\text{meas}} - F15_{\text{mod}})$, where $F15_{\text{meas}}$ = the measured field and $F15_{\text{mod}}$ = the modeled field. This definition is valid since $F15_{\text{meas}}$ is the field measured from the boom, whereas $F15_{\text{mod}}$ is theoretically the measurement of a sensor not on the boom, thereby making $(F15_{\text{meas}} - F15_{\text{mod}})$ the required "boom minus non-boom" measurement. The curve that plots $(F15_{\text{meas}} - F15_{\text{mod}})$ without additional twist effects is called the **baseline curve**.

However, in general, the above definition does not apply in practice. The baseline $(F15_{\text{meas}} - F15_{\text{mod}})$ also includes all real boom-induced errors and other activity, besides the twist types that are added to simulate them. This activity consists of the following and other factors: error in the model field, natural ionospheric activity, real manmade sources of magnetic fields such as satellite equipment (jumps), measurement error, and error in correlation between measurement and model. This correlation error includes magnetometer position and alignment errors due to ephemeris errors, in-flight calibration errors, and movement of the boom.

Therefore, if we minimize or neglect the errors we have control over (ephemeris error, calibration, jumps, model field), then measured-minus-modeled equals ionospheric activity. If activity is low or quiet, then ionospheric activity is low or non-existent, and measured is equal to modeled, so that we can consistently and accurately decompose $(F15_{\text{meas}} - F15_{\text{mod}})$ into the effects modeled above in Section 4.4. Therefore, it would be preferable to pick days of minimal activity.

The point of the boom study is that the boom got rid of the manmade sources of magnetic fields, but may have added errors in SSM axis versus satellite axis due to boom motion. Thus, we figure out what a boom-induced error will look like (Sections 4.6, 4.7, and 4.8), look for it (Section 4.9), so that it can be removed in the next project.

The table at the FTP link in [NOAA, 2001] reveals the following Kp indices for the days listed above in Section 4.5.2. Days 2000-050, 2000-116, and 2000-182 have low Kp values ranging between 0 and 2. The Kp values of 2000-149 and 2000-215 are moderate, with range between 1 and 3. 2000-083 has Kp values between 2 and 4.

4.5.4 The Output MFR File

“MFR” stands for Magnetic Field Records. The MFR file contains the measured-minus-modeled intensities, in NanoTesla (nT) of the magnetic field in each axis (X, Y, and Z) for each second of data that APSM successfully processed. This file also holds the minutely ephemeris, which includes information about the satellite location.

4.5.5 Calibration Independence

The studies of Sections 4.6, 4.7, and 4.8 are independent of the calibration matrices ORTHO and OFFSET used to generate the MFR files and other output. In other words, the results of these studies are the same regardless of the values of ORTHO and OFFSET. This premise is true since the results compare plotted curves with various simulated boom twists to the same curves without them, as well as comparing different simulated twists to one another. In each of these comparisons, ORTHO and OFFSET are kept at fixed amounts.

In contrast, the boom-effect decomposition study of Section 4.9 is NOT independent of ORTHO and OFFSET. The results of each data day, tabulated in Sections 4.9.1.2 through 4.9.1.6, are the solution coefficients to a least-squares equation. This equation involves output data that depend on ORTHO and OFFSET. Likewise, the other results of Section 4.9 are based on calibration-dependent data.

However, the overall results summarized in Section 4.9.3 are expected to be the same no matter what particular calibration matrices are used.

4.6 Confirming the Results of the Boom Simulation Study

The first task of the F15 experiment was to confirm which results previously obtained in *Cook, et al.* [1997] hold for each data set, and to change them if necessary.

4.6.1 Method Used to Produce the Data Plots

As in *Cook, et al.* [1997], seven variations of APSM were used, one for each F15-boom twist type tabulated below. Each variation was obtained by switching on and off calls from APSM.F to subroutines APSM_OSCILLATION, APSM_THERMAL, and APSM_IMPULSE, and by changing parameters in APSM_OSCILLATION and APSM_IMPULSE themselves.

After all MFR files were produced, the actual data was separated from the ephemeris in each MFR file and copied to a test file, whose name represented the day when this data was collected. An IDL program then converted these test files into GIF-image plots of magnetic field intensity (NanoTesla) versus Universal Time in seconds. APSM was then revised and recompiled for the next variation.

In APPENDIX H, the plots in Figures 48 through 54 cover all cases for the first four hours (midnight to 04:00 UT) of Julian Day 1999-357 (12/23/1999). Figures 48 through 54 are treated in Section 4.6. Section 4.7 discusses the plots in Figures 55 through 58. The last plots, in Figures 59 through 63, belong to Section 4.9 and do not cover Day 1999-357.

Each line of Table 10 below represents a variation of APSM run in this study. The left-hand entry of each line is a template for the name of the plot files produced, the central entry is the figure number in APPENDIX H, and the right-hand entry describes the experimental conditions graphed in the plot files. In each file name, "yyddd" = last two digits of year, followed by the day-of-year. "s" = Section of the day (1-6) where each Section covers four hours.

| TABLE 10. Table of Plots | | |
|--------------------------|------------|--|
| Name | Figure No. | Conditions |
| BASELINE_yyddd_s.GIF | 48 | No twist |
| OSC101_yyddd_s.GIF | 49 | Continual twist in 2 dimensions: twist = (1,0,1) degrees in (A,B,C) |
| OSC11MINUS1_yyddd_s.GIF | 50 | Continual twist in 3 dimensions: twist = (1,1,-1) degrees in (A,B,C) |
| THERM_yyddd_s.GIF | 51 | Sun-induced twist, maximum twist = 2.5 degrees |
| IMPUL1P5_yyddd_s.GIF | 52 | Damped impulse twist, maximum twist = 1.5 degrees |
| IMPUL2P5_yyddd_s.GIF | 53 | Damped impulse twist, maximum twist = 2.5 degrees |
| ALL_yyddd_s.GIF | 54 | Combined twists of OSC11MINUS1, THERM, and IMPUL2P5 |

4.6.2 Results

The resulting GIF plots were visually inspected. The curves of each variation of APSM were compared and observations made, as outlined below in Sections 4.6.2.1 through 4.6.2.3.

4.6.2.1 Effects of Different Twist Types

The baseline case is shown below in Figure 21, and again in Figure 48 in APPENDIX H.

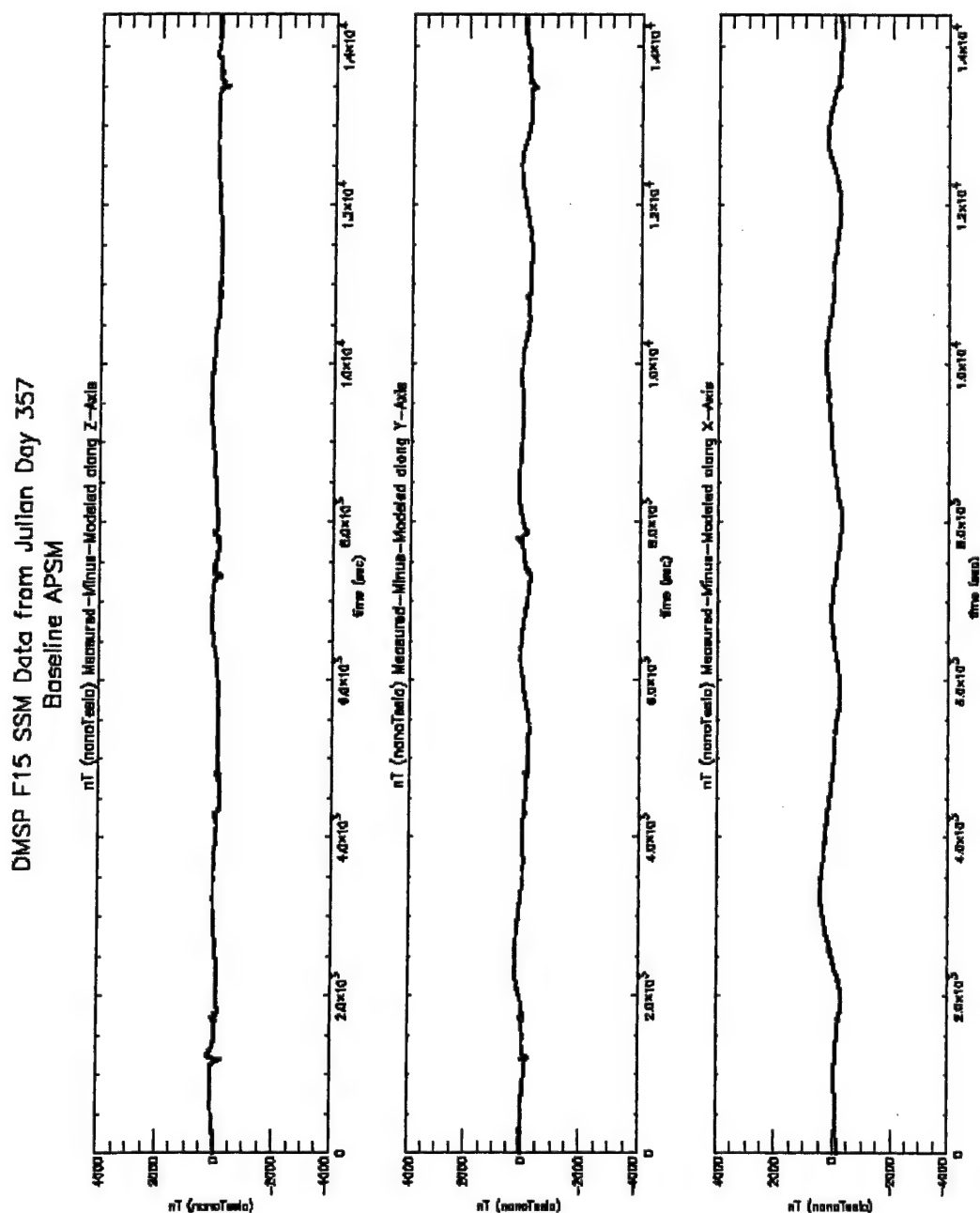


Figure 21. Baseline Curve, Day 357-1999, 00:00-04:00 UT (and Figure 48 in APPENDIX H).

Its data lacks angular-twist changes in the magnetic field. The baseline curves have oscillations in all three axes that are similar to, but most often weaker than, those of the continual-twist cases. The jump-removal subroutines `APSM_REMOVE_LARGE_JUMPS`, `APSM_REMOVE_SMALL_JUMPS`, and the artifact-noise removal subroutine `APSM_REMOVE_NOISE` leave these curves mostly smooth. However, most of the baseline curves Y and Z have bumps that resemble knots at the north and south latitude peaks of each orbit. Figure 22 displays the occurrence of these bumps in one orbit.

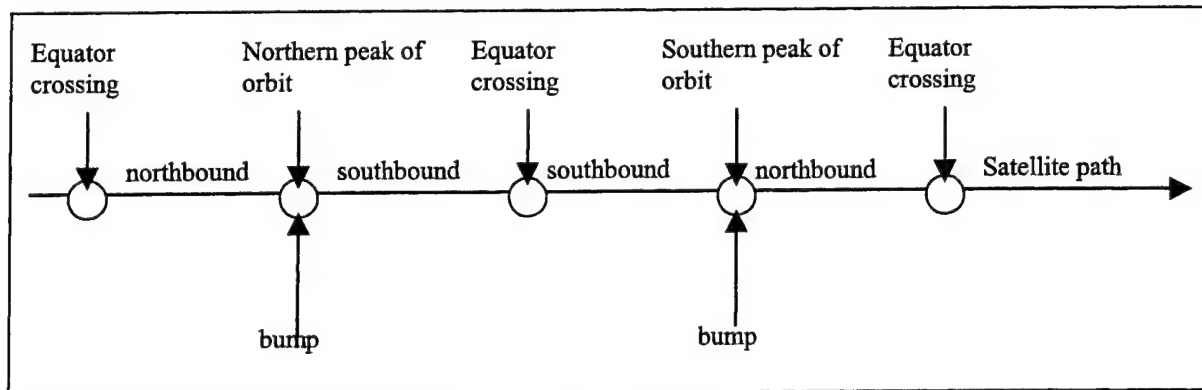


Figure 22. Occurrence of Phenomena in Baseline Curves.

Figure 23 shows that simulating the continual-twist case yields an orbital-periodic artifact consisting of waves with amplitude of roughly 700 nT on each axis. Many waves have two humps, one higher than the other. Sometimes, the smaller hump is barely visible. For other waves it is nonexistent, so there is only one hump. The waves on all three axes are approximately centered over the zero-nT line. The peaks and troughs of the X-axis curve occur whenever the satellite crosses the equator, whereas the peaks and troughs of curves Y and Z take place when the satellite crosses the day-night terminator. Figure 24 displays the occurrence of peaks and troughs in one orbit.

DMSP F15 SSM Data from Julian Day 357
Oscillation Only, $A = C = 1$ deg, $B = 0$ deg

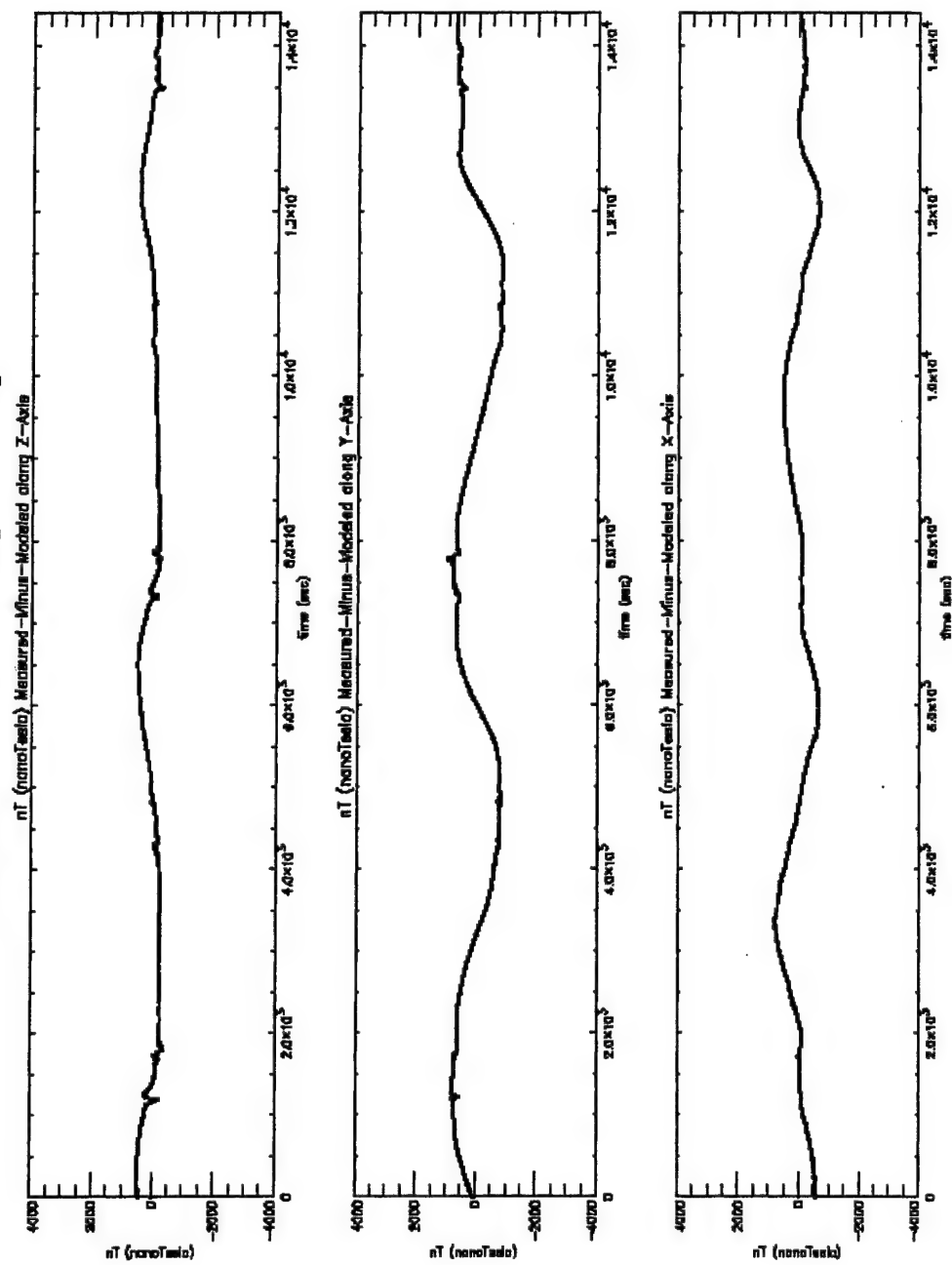


Figure 23. Continual Twist, $(A,B,C) = (1,0,1)$, Day 357-1999, 00:00-04:00 UT
(Figure 49 in APPENDIX H).

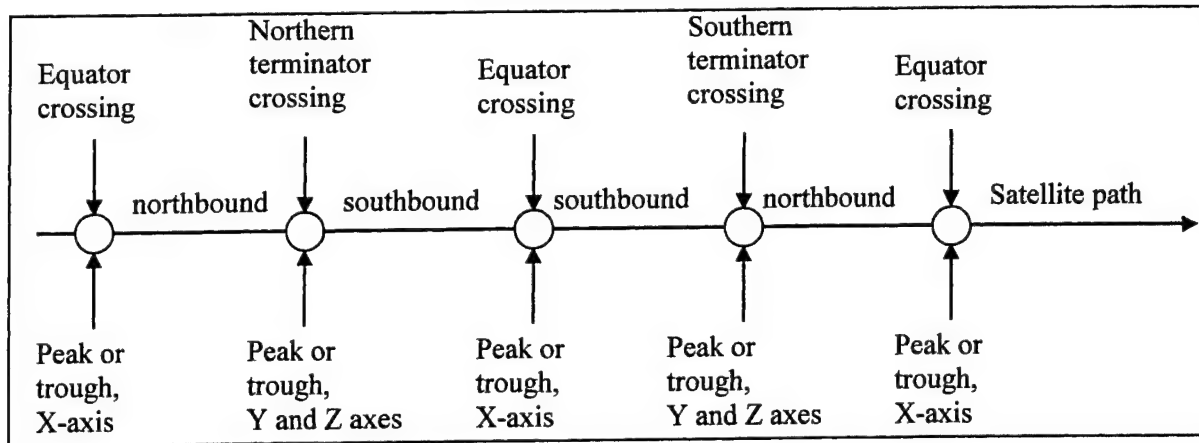


Figure 24. Occurrence of Peaks and Troughs in One Orbit for the Continual Twist Case.

Figure 25 depicts the simulation of the sun-dependent twist, which also results in an orbitally-periodic artifact in all three axes. This artifact is not in phase with the continual-twist artifact. Larger in amplitude than the continual-twist waves, the thermal-twist waves have peaks that correspond to crossings of the day-night terminator that occur near extremes of the satellite latitude.

The Z-axis curve has a double peak on each peak-trough-peak cycle. This double peak occurs at two spots with amplitude typically about 500 nT. These peaks straddle a valley in the curve where the satellite passes from night to day. This valley occupies the zero-nT level and spans roughly 1800 seconds, or a half-hour. The double peak is less intense than the trough 1500 to 2000 nT deep, where the satellite crosses from day to night. This pattern is inverted for the Y-axis. The waves on the Z-axis are centered under the zero-nT line, whereas the Y-curve is centered over this line, unlike the continual twist in which both curves are centered on this line. The X-curve is centered on this line, lacks double peaks, and its peaks and troughs occur at equator crossings. Figure 26 displays the occurrence of peaks and troughs in one orbit.

DMSP F15 SSM Data from Julian Day 357
Thermal Only

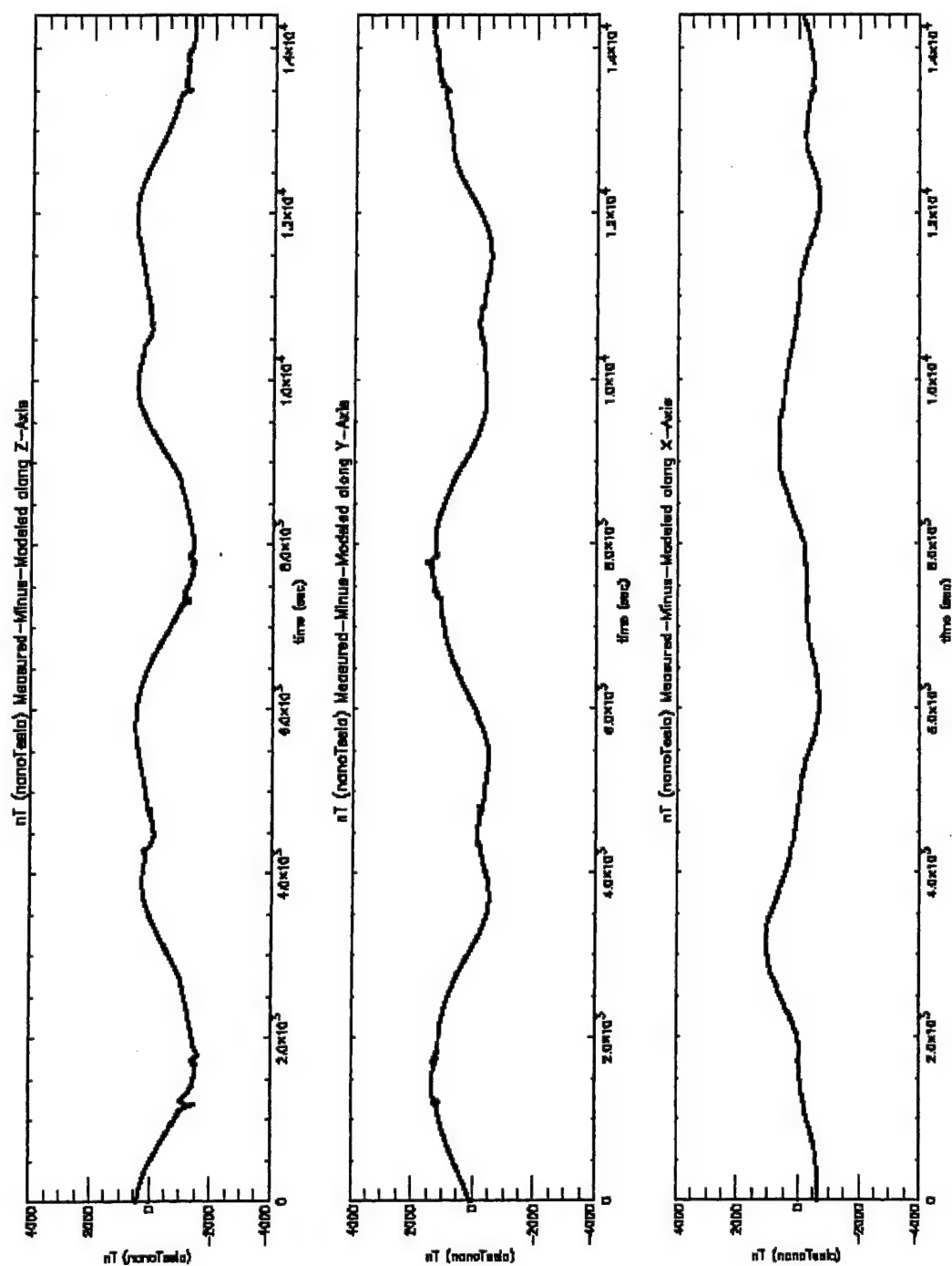


Figure 25. Thermal Twist, Maximum Angle = 2.5 degrees, Day 357-1999, 00:00-04:00 UT
(Figure 51 in APPENDIX H).

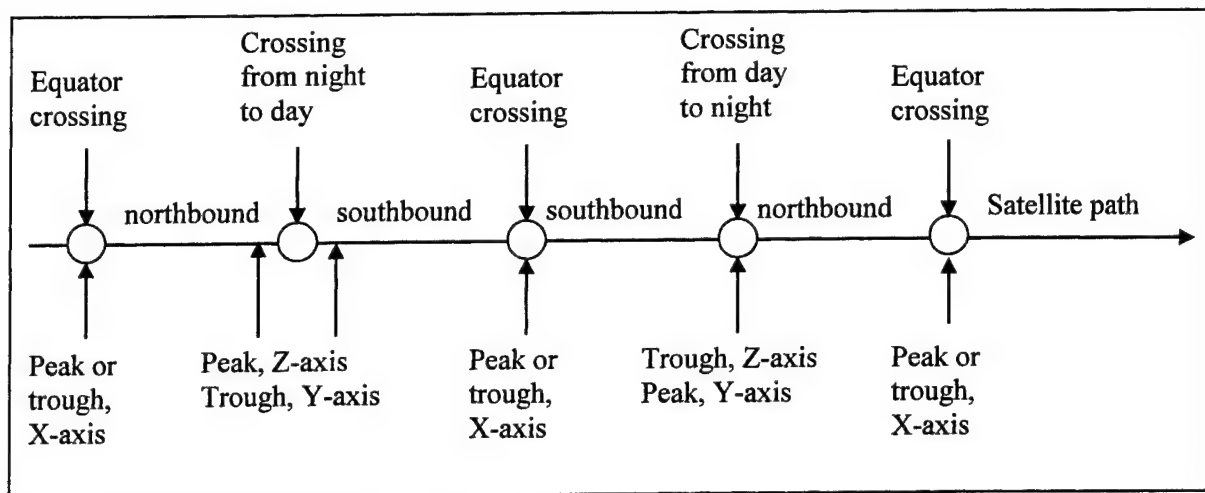


Figure 26. Occurrence of Peaks and Troughs in One Orbit For the Thermal Twist Case.

As depicted in Figure 27 and in Figure 53, simulating the damped impulse results in the baseline curve plus spikes that appear straight since each spike lasts a short time (for one minute) compared with the whole plot (four hours per page).

Each impulse in Subroutine APSM_IMPULSE is a quick rotation in all three planes (XY, XZ, and YZ in this order) by the same angle. Four such impulses per orbit are applied to the satellite boom: one at each equatorial crossing, and one at each crossing of the day-night terminator. While many crossings induce spikes in all three curves, for the equatorial crossings the spikes on the X-curve are higher than the spikes in the dimensions Y and Z, whereas the day-night crossings produce the largest spikes on curves Y and Z; see Figure 28.

DMSP F15 SSM Data from Julian Day 357
Impulse Only, Max. Impulse Angle = 2.5 deg

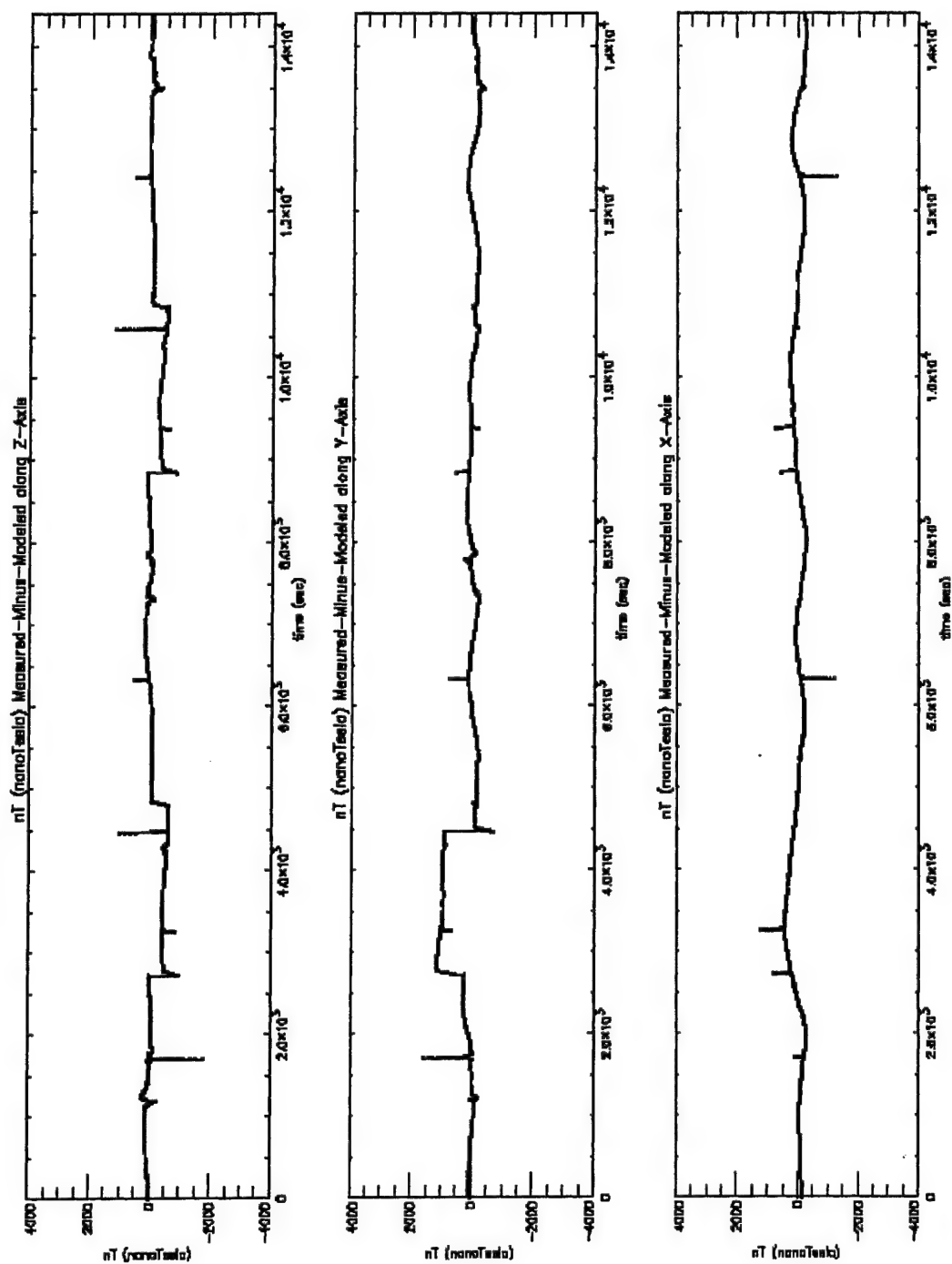


Figure 27. Impulse Twist, Maximum Angle = 2.5 degrees, Day 357-1999, 00:00-04:00 UT
(Figure 53 in APPENDIX H).

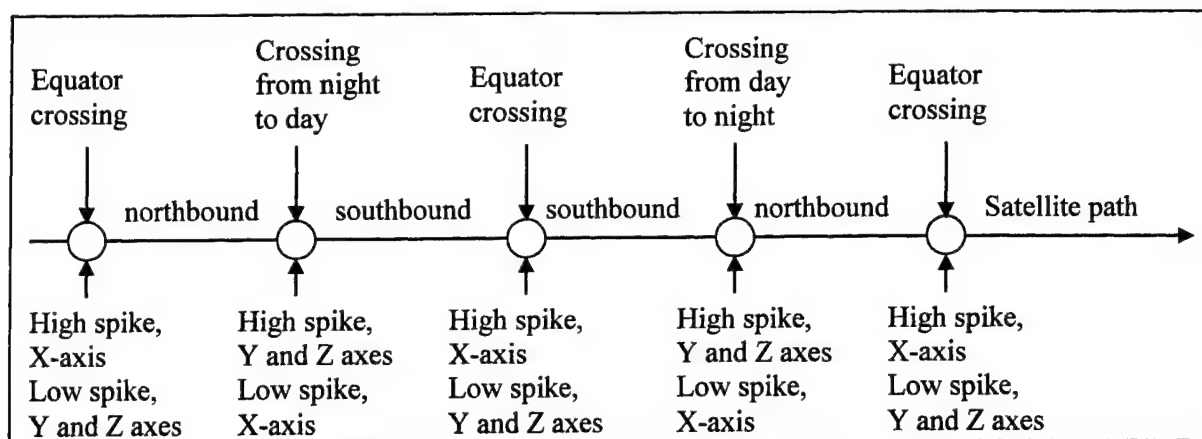


Figure 28. Occurrence of Spikes Due for One Orbit in the Impulse Case.

If these spikes exist in real data, there is the issue of removing such spikes without removing real geophysical phenomena. The trailing edge curve of the spike presents special challenges, as it may be difficult to differentiate features of the auroral regions from activity, or to measure its amplitude as a function of time with real data.

The amplitude of curve X that includes all twist types (Figure 29 and Figure 54) is the sum of the amplitudes of curve X for OSC11MINUS1, THERM, and IMPUL2P5. The same holds true for curves Y and Z.

DMSP F15 SSM Data from Julian Day 357
Impulse, Thermal, and Oscillation

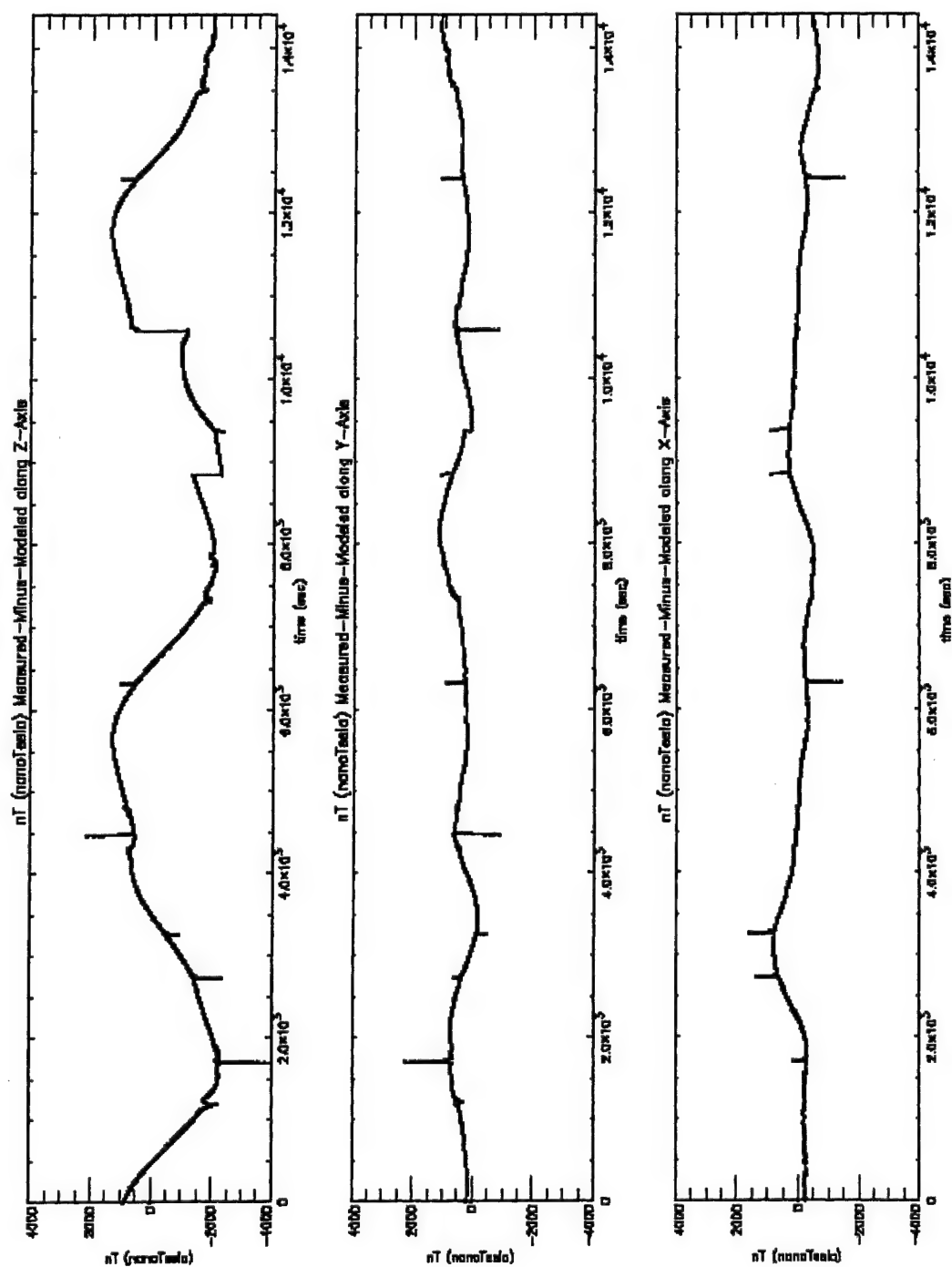


Figure 29. Combination of Continual, Thermal, and Impulse Twists, Day 357-1999, 00:00-04:00 UT (Figure 54 in Appendix APPENDIX H).

4.6.2.2 Two Dimensions versus Three (Continual Twist)

A comparison of Figures 49 and 50 shows that whereas the amplitudes of curves X and Y are independent of the number of dimensions, the Z-axis exhibits a higher-amplitude wave in three dimensions than in two. In fact, the Z-curve has at least the same amplitude, and about the same times of peaks and troughs, as does the Y-curve.

4.6.2.3 1.5 Degrees versus 2.5 Degrees (Impulse Twist)

Figures 52 and 53 demonstrate that the basic curve shape is independent of the angle, but the spikes are about 5/3 as long for 2.5 degrees as for 1.5, suggesting that the spike length is proportional to the maximum impulse angle.

4.6.3 Summary of Results of Preliminary Simulation

The results of this study confirm those of *Cook, et al.* [1997], except for oscillations in the baseline plots for many sample days of data, and stronger oscillations in the X-axis on all plots than those observed in *Cook, et al.* [1997].

These or similar oscillations in the baseline plots can also be seen in F14 data, so that they are not necessarily due to the boom.

The results of this study confirm those of *Cook, et al.* [1997], except for oscillations in the baseline plots for many sample days of data, and stronger oscillations in the X-axis on all plots than those observed in *Cook, et al.* [1997].

Many, but not all, effects (e.g. spikes, thermal oscillations) in the Z-axis are mirrored in the Y-axis.

For the continual and thermal twists, the peaks and troughs of curves Y and Z correspond to satellite crossings of the day-night terminator, which lie near its north and south extremes. However, the peaks and troughs of the X-curve occur when the satellite crosses the equator. Similarly, the impulse twist produces spikes in curves Y and Z at terminator crossings and smaller spikes at equatorial crossings. As in the other twists, this pattern is reversed for the X-curve.

According to Section 4.6.2.3, multiplying an impulse by a certain factor multiplies the amplitude of the resulting spikes by the same factor. This result suggests that multiplying any twist effect by a given factor will multiply the amplitude of the plot by the same factor. Also, the case of all twist types shows that combining two or more twist types adds their effects on the plot, following the rules of constructive and destructive interference of waves. This property is evident from the twist-type routines (OSCILLATION, THERMAL, and IMPULSE) of APSM that add each effect, one at a time, to the amount to be plotted. In other words, the relationship between twist effects and curve amplitude appears to be both multiplicative and additive, and

thus linear. This conjecture will be proved below in Sections 4.8.4.1 through 4.8.4.3 for all three twist types analyzed in this report.

4.7 Filling In The Gaps: Effects Of Dimensions Of Continual Twist

Because of time and storage considerations, the studies in Sections 4.7 and 4.8 used only the three days 1999-357, 2000-012, and 2000-019 corresponding to 12/23/1999, 01/12/2000, and 01/19/2000, respectively. These days were selected because they had few data gaps relative to those of the other days. These studies were run similarly to the first study (see Section 4.6.1 above).

It was decided that several more cases were needed as a supplement to the above study. These cases were added to corroborate the results of Section 4.6 and provide new conclusions.

4.7.1 The Compared Plots

These cases produced the following GIF files for each of the above three days. The GIF files for the first four hours of Day 1999-357 appear in APPENDIX H, Figures 55 through 58:

| | | |
|--------------------|----|--|
| OSC111_yyddd_s.GIF | 55 | Continual twist = (1,1,1) degrees in (A,B,C) |
| OSCA01_yyddd_s.GIF | 56 | Continual twist = (1,0,0) degrees in (A,B,C) |
| OSCB01_yyddd_s.GIF | 57 | Continual twist = (0,1,0) degrees in (A,B,C) |
| OSCC01_yyddd_s.GIF | 58 | Continual twist = (0,0,1) degrees in (A,B,C) |

These additional trial runs, combined with the runs for (1,1,-1) and (1,0,1) in Section 4.6.1 above, brought the total for this study to the six cases listed below:

| | |
|--------------------|------|
| (A,B,C) = (1,1,-1) | (12) |
| (A,B,C) = (1,1,1) | (13) |
| (A,B,C) = (1,0,1) | (14) |
| (A,B,C) = (0,0,1) | (15) |
| (A,B,C) = (0,1,0) | (16) |
| (A,B,C) = (1,0,0) | (17) |

Each continual twist was applied nonstop throughout the entire day. These GIF plots were visually compared with each other based on the overall amplitudes of curves X, Y, and Z in the plots.

4.7.2 Results

Table 11 charts the six cases. Each entry of the table contains codes for X, Y, and Z that indicate the result of this comparison. Each of these codes is interpreted as follows:

- up - case directly above this box has the sharper curve (higher overall amplitude)
- right - case directly to the right of this box has the sharper curve
- = - the curve has approximately equal amplitude in both cases

For example, "X up" means that the amplitude of the X-curve in the case above this box is greater than in the case to the right of this box. In particular, for the entry drawn in bold below, curves X and Y for (1,0,1) have higher amplitudes, but the Z-curve has a lower amplitude, than for (0,1,0).

The figure numbers in this table correspond to plots in Figures in APPENDIX H that illustrate each case for Day 1999-357.

TABLE 11. Comparison of the Six Cases

| | | | | | |
|-------------------------|------------------------|--|-------------------------|------------------------|------------------------|
| (1,1,-1) (Figure 50) | | | | | |
| X = Y = Z = | (1,1,1) (Figure 55) | | | | |
| X = Y = Z up | X = Y = Z up | (1,0,1) (Figure 49) | | | |
| X = Y = Z up | X = Y = Z up | X = Y = Z up | (0,0,1) (Figure 58) | | |
| X up Y up Z = | X up Y up Z = | X up Y up Z right | X up Y up Z right | (0,1,0) (Figure 57) | |
| X up Y up Z up | X up Y up Z up | X up Y up Z = | X up Y up Z right | X = Y = Z up | (1,0,0) (Figure 56) |

The results in this table are summarized as follows.

The cases (1,1,-1), (1,1,1), (1,0,1), and (0,0,1), for which the angle $C = 1$ degree, produce sharper curves in X and Y than do (0,1,0) and (1,0,0), for which $C = 0$. This result confirms the theoretical assumption that increasing angle C sharpens curves X and Y; this assumption is stated in Section 4.8.3 and proved in Section 4.8.4.1.

The cases (1,1,-1), (1,1,1), and (0,1,0) produce a sharper Z-curve than do (1,0,1) and (1,0,0). The Z-curve for (0,0,1) is the flattest. However, according to Observation 2 in Section 5.8.3,

angles A and B sharpen the Z-curve, so (0,1,0) should have been in the middle category with (1,0,1) and (1,0,0).

There is no essential amplitude difference between (1,1,1) and (1,1,-1), but in X and Y (controlled by C) there is a 180-degree (complete) phase difference because $C = 1$ for (1,1,1) and $C = -1$ for (1,1,-1). This statement agrees with the conjecture, stated above in Section 4.6.3 and proved below in Section 4.8.4.1, that multiplying C by -1 multiplies the amplitudes of X and Y by the same factor -1.

4.8 How The Factors Influence The Measured Field

NOTE: Any mention below of "multiplying the amplitude (or another feature) of a curve by N" often means multiplying it by a factor approximately N, but not necessarily equal to N itself.

4.8.1 Selection of Factors

This study analyzed what factors (and parameter value for each factor) produced the greatest effects. However, the possibilities were so complex that there was no time to cover all of them. Thus, we chose the following factors and their parameters:

Day Number (preprofile)

Time of Day

Amount of continual twist in YZ plane (Angle A): 1, 5, 10, and 30 degrees

Amount of continual twist in XZ plane (Angle B): 1, 5, 10, and 30 degrees

Amount of continual twist in XY plane (Angle C): 1, 5, 10, and 30 degrees

Maximum twist angle induced by heat: 5, 10, and 30 degrees

Maximum impulse angle: 5, 10, and 30 degrees

Damping time: 5, 10, 60, 120, and 1200 seconds

Number of seconds to apply impulse: 5, 240, and 2400 seconds

As explained in Section 4.4.2.1 above, each continual twist was applied nonstop the entire day. The continual twist was the only twist type in which the three rotation angles were different from each other. As stated in Section 4.4.2.2, each sun-induced twist was at its maximum when the satellite crossed from day to night, and zero in night-to-day crossings. At all other times, this twist varied linearly. As Section 4.4.2.3 indicates, each damped impulse twist was applied briefly at the equator and terminator crossings.

The factors of day and time were analyzed using previously produced graphs. The remaining factors utilized the following variations of APSM:

| | |
|-----------------------|--|
| OSCA01_yydd_s.GIF | Continual twist = (1,0,0) degrees in (A,B,C) |
| OSCA05_yydd_s.GIF | Continual twist = (5,0,0) degrees in (A,B,C) |
| OSCA10_yydd_s.GIF | Continual twist = (10,0,0) degrees in (A,B,C) |
| OSCA30_yydd_s.GIF | Continual twist = (30,0,0) degrees in (A,B,C) |
| OSCB01_yydd_s.GIF | Continual twist = (0,1,0) degrees in (A,B,C) |
| OSCB05_yydd_s.GIF | Continual twist = (0,5,0) degrees in (A,B,C) |
| OSCB10_yydd_s.GIF | Continual twist = (0,10,0) degrees in (A,B,C) |
| OSCB30_yydd_s.GIF | Continual twist = (0,30,0) degrees in (A,B,C) |
| OSCC01_yydd_s.GIF | Continual twist = (0,0,1) degrees in (A,B,C) |
| OSCC05_yydd_s.GIF | Continual twist = (0,0,5) degrees in (A,B,C) |
| OSCC10_yydd_s.GIF | Continual twist = (0,0,10) degrees in (A,B,C) |
| OSCC30_yydd_s.GIF | Continual twist = (0,0,30) degrees in (A,B,C) |
| THERM05_yydd_s.GIF | Sun-induced twist, maximum twist = 5 degrees |
| THERM10_yydd_s.GIF | Sun-induced twist, maximum twist = 10 degrees |
| THERM30_yydd_s.GIF | Sun-induced twist, maximum twist = 30 degrees |
| IMPMAX05_yydd_s.GIF | Damped impulse twist, maximum twist = 5 degrees |
| IMPMAX10_yydd_s.GIF | Damped impulse twist, maximum twist = 10 degrees |
| IMPMAX30_yydd_s.GIF | Damped impulse twist, maximum twist = 30 degrees |
| IMPDM005_yydd_s.GIF | Damped impulse twist, damping time = 5 seconds |
| IMPDM010_yydd_s.GIF | Damped impulse twist, damping time = 10 seconds |
| IMPDM060_yydd_s.GIF | Damped impulse twist, damping time = 60 seconds |
| IMPDM120_yydd_s.GIF | Damped impulse twist, damping time = 120 seconds |
| IMPDM1200_yydd_s.GIF | Damped impulse twist, damping time = 1200 seconds |
| IMPSEC005_yydd_s.GIF | Damped impulse twist, apply impulse for 5 seconds |
| IMPSEC240_yydd_s.GIF | Damped impulse twist, apply impulse for 240 seconds |
| IMPSEC2400_yydd_s.GIF | Damped impulse twist, apply impulse for 2400 seconds |

4.8.2 Observed Results

This Section lists the factors that were considered, and their contributions to the appearance of the plots delineated in Sections 4.6.1, 4.7.1, and 4.8.1.

4.8.2.1 Day of Year

The results, even the appearance of the baseline plots, vary with the day number. The prepfiles for Days 2000-004, 2000-005, 2000-008, 2000-010, 2000-016, 1999-356, and 1999-363 exhibit oscillations in the baseline curves like those of the continual-twist case. The rest show weaker oscillations in varying degrees, as in Figure 48 for Day 1999-357. It is worth repeating that there is one data file per day of year.

However, the plots with all twist types look similar for all days, since the twist effects overshadow the individuality evident in the baseline plots. Moreover, these plots contain

pronounced oscillations. Thus it is easy to see that all days exhibit the same pattern of peaks and troughs with the same periodicity, except for differences between days of no-data zones, artifacts, curve bumps, and spikes. There is also a little time shift between one day and the next. Specifically, there are 447 such curve cycles in about 45,520 minutes so that the average cycle lasts 101.8 minutes. Since $1440/101.8 = 14.16$, the remainder of 0.16 (out of a possible 1.0) confirms the fact that the daily shift takes 5 to 7 days to accumulate to one full cycle. Indeed, the established average period has been shown to be 6000 to 6200 seconds (100 to 103.33) minutes (see [Cook, et al., 1997b]). In summary, the oscillations are orbital periodic, not dependent on the time of day.

4.8.2.2 Time of Day

The time of day on the horizontal axes of all graphs is Universal Time. No unexplained phenomena are observed in the time domain in these experiments; hence the UT does not influence the results of these experiments.

4.8.2.3 Continual-Twist Angle A

The values $A = 1, 5, 10$, and 30degrees show that multiplying the twist angle by the factor N multiplies the curve amplitudes of Y and Z also by N . However, curve X remains identical.

4.8.2.4 Continual-Twist Angle B

The values $B = 1, 5, 10$, and 30degrees show that multiplying the twist angle by N multiplies the curve amplitudes of X and Z also by N . However, curve Y remains identical.

4.8.2.5 Continual-Twist Angle C

The values $C = 1, 5, 10$, and 30degrees show that multiplying the twist angle by N multiplies the curve amplitudes of X and Y also by N . However, curve Z remains identical.

4.8.2.6 Maximum Heat-Induced Angle

These plots show that multiplying the maximum heat angle P_{MAX} by N multiplies the amplitudes of all curves (X , Y , and Z) by approximately N . However, when P_{MAX} is much greater than 30 degrees, the growth of the amplitude is slower.

4.8.2.7 Maximum Impulse Angle

These plots show that the height (or depth) of each impulse on all three axes is proportional to the maximum impulse angle. However, when P_{MAX} is much greater than 30 degrees, the growth of the impulse is slower.

4.8.2.8 Damping Time

Lowering the damping time from its default 30 seconds to 5 seconds cuts the average impulse height by about 40 percent. The impulse height is slightly larger for 10 seconds than for 5. At 120 seconds, there are more artifacts and the larger impulses thicken and are transformed from stick-like protrusions to A's; i.e. with a slight gap between the left and right ends of the spike. At 1200 seconds, there are fewer artifacts than at 120, but the spikes are much shorter, a few of them disappearing into the curve.

4.8.2.9 Duration of Applied Impulse

The plot in which each impulse lasts for 240 seconds appears similar to the plot for 5 seconds. However, the 2400-second plots show fewer spikes on all curves. In other words, increasing the time of application END_IMP of impulses does little except to reduce the number of spikes when the impulses last a very long time.

The reader might wish to review the damped-impulse paragraph near the end of Section 4.6.2.1 and the fact that each orbit lasts 100 to 104 minutes (Section 4.8.2.1). This information is needed for the next paragraph.

In the case of a damping time near 1200 seconds, the impulses become smaller but are all still present. However, the impulse duration END_IMP = 2400 seconds totally lacks the day-night terminator-crossing impulses seen at END_IMP = 5 and END_IMP = 240 for which the spikes in curves Y and Z are large compared to the other spikes. When END_IMP = 240 seconds (= 4 minutes), each impulse ends before the next one starts one-quarter orbit (about 25 to 26 minutes) later. However, at END_IMP = 2400 seconds (= 40 minutes), the first impulse (which is equatorial) is still active when the satellite crosses the terminator. Thus, the terminator impulse can not be started, but the following equatorial one can, since it starts 51 to 52 minutes (one-half orbit), over 40 minutes after the first impulse. The impulse recording continues in this fashion so that only the equatorial spikes are plotted.

4.8.3 Summary of Results of Factor Analysis

The results of this study lead to the following general observations.

- 1) Unlike the Universal Time, the day number influences the results. This influence is reflected in variations of amplitude of the baseline curves for the different days.
- 2) Multiplying an angle (A, B, or C) by N does not influence its corresponding curve, but multiplies the amplitude of each of the other two curves by a factor equal to, or approximately, N. For example, multiplying A by N leaves the X-curve alone, but multiplies the amplitudes of Y and Z by N. For a proof of this observation, see Section 4.8.4.1.
- 3) Multiplying the maximum heat angle by N multiplies the amplitudes of curves X, Y, and Z by N. For proof, see Section 4.8.4.2.

4) Multiplying the maximum impulse angle by N multiplies the heights of the plotted spikes on axes X, Y, and Z by N. For proof, see Section 4.8.4.3.

5) Multiplying the damping time by N raises the impulse height, but by a factor less than N. Moreover, the impulse height actually *decreases* with damping time as the latter quantity grows near 1200 seconds. As the damping time increases, the spikes thicken and split apart at the bottom. For proof, see Section 4.8.4.4.

6) Increasing the time of application of impulses does little except to reduce the number of spikes when each impulse lasts over 25 to 26 minutes. For proof, see Section 4.8.2.9 above.

4.8.4 Proofs of Results of Factor Analysis

This Section provides mathematical proofs of several observations listed above in Section 4.8.3. Observations 2, 3, 4, and 5 are proven below in Sections 4.8.4.1, 4.8.4.2, 4.8.4.3, and 4.8.4.4, respectively. Observation 1 is obvious and therefore needs no proofs. Observation 6 was already proven above in Section 4.8.2.9.

4.8.4.1 Proof of Linearity between Continual-Twist Angles and Curve Amplitudes

This Section proves Observation 2 above, that multiplying a continual-twist angle by N leaves its corresponding curve alone, but multiplies the amplitudes of the other two curves by N.

In Subroutine APSM_OSCILLATION, the vector:

$$V = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad (18)$$

is multiplied on the left by $R_A R_B R_C$ to obtain $R_A R_B R_C V$. R_A is the rotation matrix that rotates a vector A degrees in the YZ plane, R_B B degrees in the XZ plane, and R_C C degrees in the XY plane. That is,

$$R_A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & cA & sA \\ 0 & -sA & cA \end{bmatrix}, \quad R_B = \begin{bmatrix} cB & 0 & -sB \\ 0 & 1 & 0 \\ sB & 0 & cB \end{bmatrix}, \quad R_C = \begin{bmatrix} cC & sC & 0 \\ -sC & cC & 0 \\ 0 & 0 & 1 \end{bmatrix}, \quad (19)$$

where:

cA , cB , and cC are shorthand for $\cos(A\pi/180)$, $\cos(B\pi/180)$, and $\cos(C\pi/180)$, respectively, and sA , sB , and sC are shorthand for $\sin(A\pi/180)$, $\sin(B\pi/180)$, and $\sin(C\pi/180)$, respectively. The $\pi/180$ adjustment is due the fact that A, B, and C are the twist angles in degrees, not radians.

The above rotation produces the measured vector. From this result we subtract the modeled vector, which is theoretically the original vector V, to obtain the 3x1 measured-minus-modeled vector that is written into the output MFR file. Let this vector be called W. To simplify our

calculation of W , we ignore filtering and further adjustments between the above subtraction and the time W is written into the MFR file.

In the baseline case $W = V - V = 0$. However, in the oscillation case, we obtain $W = R_A R_B R_C V - V = (R_A R_B R_C - I)V$, where I is the 3×3 identity matrix. In the general case,

$$W = \begin{bmatrix} (cBcC - 1)x + cBsCy - sBz \\ (sAsBcC - cAsC)x + (sAsBsC + cAcC - 1)y + sAcBz \\ (cAsBcC + sAsC)x + (cAsBsC - sAcC)y + (cAcB - 1)z \end{bmatrix}. \quad (20)$$

Let the three components of W be w_1 , w_2 , and w_3 . We now prove that A does not influence w_1 , but that multiplying A by a factor N results in multiplying w_2 and w_3 by N . That A does not change w_1 is obvious. The second statement is proved as follows.

The first step is to evaluate the Taylor-series expansions of $s(A)$, $s(NA)$, $c(A)$, and $c(NA)$. The first two terms of each are:

$$s(A) = \sin(A\pi/180) \approx A\pi/180 - \frac{(A\pi/180)^3}{3!} \quad (21)$$

$$s(NA) = \sin(NA\pi/180) \approx NA\pi/180 - N^3 \frac{(A\pi/180)^3}{3!} \quad (22)$$

$$c(A) = \cos(A\pi/180) \approx 1 - \frac{(A\pi/180)^2}{2!} \quad (23)$$

$$c(NA) = \cos(NA\pi/180) \approx 1 - N^2 \frac{(A\pi/180)^2}{2!} \quad (24)$$

For all studies in the F15 experiment, the maximum value of NA is 30. Thus, the highest-magnitude ratio of second term to first term in the above four Taylor expansions is

$$\frac{N^2 A^2 \left(\frac{\pi}{180}\right)^2}{2} < \frac{N^2 A^2 \left(\frac{10}{32400}\right)}{2} = \frac{N^2 A^2}{6480} \leq \frac{900}{6480} = \frac{1}{7.2}, \quad (25)$$

so that we can always ignore the second term. Therefore, we can assume that $s(NA) = Ns(A)$ and $c(NA) = 1$.

If we keep $B = C = 0$ and allow N to vary, then $R_B = R_C = I$ so that

$$W = (R_{NA} - I)V = \begin{bmatrix} 0 & 0 & 0 \\ 0 & c(NA) - 1 & s(NA) \\ 0 & -s(NA) & c(NA) - 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} \approx \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & NsA \\ 0 & -NsA & 0 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} \approx \begin{bmatrix} 0 \\ NsAz \\ -NsAy \end{bmatrix} = N \begin{bmatrix} 0 \\ sAz \\ -sAy \end{bmatrix} \quad (26)$$

Thus, multiplying A by N leaves the first component of W alone, but multiplies the last two components by N.

Similarly, if we multiply B by N and keep A = C = 0, then $R_A = R_C = I$ so that

$$W = (R_{NB} - I)V = \begin{bmatrix} c(NB) - 1 & 0 & -s(NB) \\ 0 & 0 & 0 \\ s(NB) & 0 & c(NB) - 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} \approx \begin{bmatrix} 0 & 0 & -NsB \\ 0 & 0 & 0 \\ NsB & 0 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} \approx \begin{bmatrix} -NsBz \\ 0 \\ NsBx \end{bmatrix} = N \begin{bmatrix} sBz \\ 0 \\ sBx \end{bmatrix} \quad (27)$$

That is, w_2 is left alone, but w_1 and w_3 are multiplied by N.

If we multiply C by N and keep A = B = 0, then $R_A = R_B = I$ so that

$$W = (R_{NC} - I)V = \begin{bmatrix} c(NC) - 1 & s(NC) & 0 \\ -s(NC) & c(NC) - 1 & 0 \\ 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} \approx \begin{bmatrix} 0 & NsC & 0 \\ -NsC & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} \approx \begin{bmatrix} NsCy \\ -NsCx \\ 0 \end{bmatrix} = N \begin{bmatrix} sCy \\ -sCx \\ 0 \end{bmatrix} \quad (28)$$

Here w_3 is left alone, but w_1 and w_2 are multiplied by N.

We have just proven that multiplying any angle by N and keeping the other angles zero does not influence the curve corresponding to the multiplied angle, but multiplies the amplitudes of the other curves by N. This is Observation 2 in Section 4.8.3 above.

4.8.4.2 Proof of Linearity between Thermal-Twist Angle and Curve Amplitudes

This Section proves Observation 3 above, that multiplying the heat-induced twist angle by N multiplies the amplitudes of the all three curves by N.

Subroutine APSM_THERMAL merely rotates the measured-field vector:

$$V = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad (29)$$

in the XY, XZ, and YZ planes by the angle:

$$H \equiv \left(1 - \frac{LAT}{LAT_ABS} \right) \frac{P_{MAX}}{2} \quad (30)$$

where:

| | | |
|---------|---|--|
| LAT | = | present latitude of satellite |
| LAT_ABS | = | maximum absolute value of the satellite latitude |
| PMAX | = | selected value of maximum twist |

We wish to prove that multiplying PMAX by N multiplies the amplitudes of all three measured-minus-modeled curves by N. Indeed, multiplying PMAX by N increases the angle from H to NH. Now let cH, c(NH), sH, and s(NH) equal $\cos(H\pi/180)$, $\cos(NH\pi/180)$, $\sin(H\pi/180)$, and $\sin(NH\pi/180)$, respectively. Denote the squares of these quantities as c^2H , $c^2(NH)$, s^2H , and $s^2(NH)$, respectively. Similarly, represent the cubes as c^3H , $c^3(NH)$, s^3H , and $s^3(NH)$. Then for PMAX*N the measured-minus-modeled vector W equals:

$$\begin{aligned}
 W &= \begin{bmatrix} (c^2(NH) - 1)x + c(NH)s(NH)y - s(NH)z \\ (s^2(NH)c(NH) - c(NH)s(NH))x + (s^3(NH) + c^2(NH) - 1)y + s(NH)c(NH)z \\ (c^2(NH)s(NH) + s^2(NH))x + (c(NH)s^2(NH) - s(NH)c(NH))y + (c^2(NH) - 1)z \end{bmatrix} \\
 &\approx \begin{bmatrix} Ns(H)y - Ns(H)z \\ (N^2s^2(H) - Ns(H))x + N^3s^3(H)y + Ns(H)z \\ (Ns(H) + N^2s^2(H))x + (N^2s^2(H) - Ns(H))y \end{bmatrix} \quad (31) \\
 &\approx \begin{bmatrix} Ns(H)y - Ns(H)z \\ -Ns(H)x + Ns(H)z \\ Ns(H)x - Ns(H)y \end{bmatrix} = N \begin{bmatrix} s(H)y - s(H)z \\ -s(H)x + s(H)z \\ s(H)x - s(H)y \end{bmatrix},
 \end{aligned}$$

where we use the Taylor-series approximations $c(NH) = 1$ and $s(NH) = Ns(H)$ to derive the second line.

To derive the third line, we treat all occurrences of $N^2s^2(H)$ and $N^3s^3(H)$ as zero, since the largest term in their Taylor-series expansions is

$$\left(\frac{NH\pi}{180}\right)^2 \leq \left(\frac{30\pi}{180}\right)^2 = \left(\frac{30}{180}\right)^2 \pi^2 = \frac{\pi^2}{36} < \frac{10}{36} \quad (32)$$

which is small compared to 1. Here, we use the facts that the maximum thermal twist NH we use is 30 degrees and $\pi^2 < 10$.

Thus, we just proved that multiplying PMAX by N effectively multiplies each component of W by approximately N. This is Observation 3 in Section 4.8.3 above.

4.8.4.3 Proof of Linearity between Impulse Angle and Spike Heights

This Section proves Observation 4 above, that multiplying the maximum impulse angle by N multiplies the heights of the plotted spikes on all three axes by N.

Here in Subroutine APSM_IMPULSE, the angle of rotation = $\text{PMAX} \cdot \exp(-\alpha S)$, where S = amount of time elapsed since the impulse was first applied. Since $\exp(-\alpha S)$ is independent of

PMAX, the angle of rotation is always a multiple of PMAX. Except for the definition of this angle, APSM_IMPULSE uses the same algorithm as does APSM_THERMAL. Moreover, the upper limit of the angle in APSM_IMPULSE is 30 degrees like in APSM_THERMAL. Thus, the proof of Section 4.8.4.2 applies here, so that multiplying PMAX by N multiplies the amplitude of each curve, which is the height of each spike, by approximately N. This is Observation 4 in Section 4.8.3 above.

4.8.4.4 Proof of Statements about Damping Time of Impulse

Observation 5 above consists of three statements to be proved in this Section. They are repeated below for your review, then proved one at a time.

- A) Multiplying the damping time by N raises the impulse height, but by a factor less than N.
- B) The impulse height decreases with damping time as the latter grows above 1200 seconds.
- C) As the damping time increases, the spikes thicken and split apart at the bottom.

Proof:

According to Subroutine APSM_IMPULSE, wherever an impulse occurs on the plotted curves, the measured-field vector is rotated as in Section 4.8.4.2 above by the impulse angle in all three dimensions. This angle is $PMAX \cdot \exp(-\alpha S) = PMAX \cdot \exp(-LS/T)$ where:

PMAX = maximum impulse angle (in degrees),

$L = \ln(50)$,

S = number of seconds since start of impulse

where $0 \leq S < \text{END_IMP}$ and END_IMP = duration of impulse in seconds, and

T = damping time in seconds.

If we let J = the above rotation angle, then rotating the measured-field vector by J yields the measured-minus-field vector

$$\begin{aligned}
 W &= \begin{bmatrix} (c^2(J) - 1)x + c(J)s(J)y - s(J)z \\ (s^2(J)c(J) - c(J)s(J))x + (s^3(J) + c^2(J) - 1)y + s(J)c(J)z \\ (c^2(J)s(J) + s^2(J))x + (c(J)s^2(J) - s(J)c(J))y + (c^2(J) - 1)z \end{bmatrix} \\
 &\approx \begin{bmatrix} s(J)y - s(J)z \\ (s^2(J) - s(J))x + s^3(J)y + s(J)z \\ (s(J) + s^2(J))x + (s^2(J) - s(J))y \end{bmatrix} \\
 &\approx \begin{bmatrix} s(J)y - s(J)z \\ -s(J)x + s(J)z \\ s(J)x - s(J)y \end{bmatrix} = s(J) \begin{bmatrix} y - z \\ z - x \\ x - y \end{bmatrix} \approx \frac{J\pi}{180} \begin{bmatrix} y - z \\ z - x \\ x - y \end{bmatrix} = \frac{\pi}{180} PMAX e^{-\frac{LS}{T}} \begin{bmatrix} y - z \\ z - x \\ x - y \end{bmatrix},
 \end{aligned} \tag{33}$$

where we use the same notation as in Section 4.8.4.2. Theoretically, the impulse height equals the peak value of W, which occurs when S = 0 and is thus independent of T. On the other hand, the impulse height plotted is the highest point on the impulse based on the data from the output

MFR file. Let the impulse height be called W_{\max} , which = W for some value S_{\max} of S . S_{\max} is almost always somewhat *greater* than zero, so the above plotted impulse height *does* increase as T becomes larger.

To prove Statement A, it remains to show that W_{\max} increases by a factor less than N if we replace T with NT . In this case, from the above equation this factor increase is:

$$\frac{\frac{\pi}{180} PMA X e^{-\frac{LS}{NT}}}{\frac{\pi}{180} PMA X e^{-\frac{LS}{T}}} = \frac{e^{-\frac{LS}{NT}}}{e^{-\frac{LS}{T}}} = e^{\left(\frac{LS}{T} - \frac{LS}{NT}\right)} = e^{\frac{LS}{T} \left(1 - \frac{1}{N}\right)} = 50^{\frac{S}{T} \left(1 - \frac{1}{N}\right)} \leq 50^{\frac{1}{5} \left(1 - \frac{1}{N}\right)} < 2.5^{\left(1 - \frac{1}{N}\right)} \leq 2.5, \quad (34)$$

where we use the fact that $L = \ln(50)$. We also assume that $T = 5$, its starting value, and that $S \leq 1$. This latter assumption is valid since the times in the MFR file are one second apart, so surely one of them is within 1 second of the time when $S = 0$. For $N > 2.5$ the above factor increase is obviously less than N . In fact, no matter how large N becomes, this increase never treads beyond 2.5. For the minimal value $N = 1$, the increase factor is 1 and its derivative with respect to N is:

$$\frac{d}{dN} \left(e^{\frac{LS}{T} \left(1 - \frac{1}{N}\right)} \right) = \frac{LS}{TN^2} e^{\frac{LS}{T} \left(1 - \frac{1}{N}\right)} = \frac{LS}{T} \leq \frac{L}{5} = \frac{\ln(50)}{5} < 1 \quad (35)$$

since $\exp(5) > 50$. The second derivative of the increase factor for all $N \geq 1$ is:

$$\begin{aligned} \frac{d^2}{dN^2} \left(e^{\frac{LS}{T} \left(1 - \frac{1}{N}\right)} \right) &= \frac{d}{dN} \left(\frac{LS}{TN^2} e^{\frac{LS}{T} \left(1 - \frac{1}{N}\right)} \right) = \frac{LS}{T} \left[\frac{d}{dN} \left(\frac{1}{N^2} e^{\frac{LS}{T} \left(1 - \frac{1}{N}\right)} \right) \right] \\ &= \frac{LS}{T} \left[\frac{1}{N^2} \left(\frac{LS}{TN^2} e^{\frac{LS}{T} \left(1 - \frac{1}{N}\right)} \right) - \frac{2}{N^3} \left(e^{\frac{LS}{T} \left(1 - \frac{1}{N}\right)} \right) \right] = \frac{LS}{T} \left(\frac{LS}{TN^4} - \frac{2}{N^3} \right) \left(e^{\frac{LS}{T} \left(1 - \frac{1}{N}\right)} \right) < 0, \end{aligned} \quad (36)$$

since $LS/T > 0$, the exponent > 0 , and the middle term is:

$$\frac{LS}{TN^4} - \frac{2}{N^3} < \frac{1}{N^4} - \frac{2}{N^3} = \frac{1}{N^4} (1 - 2N) < 0. \quad (37)$$

Thus, for all $N > 1$ the first derivative of the increase factor is less than 1. Comparing the curve of the increase factor versus N with the straight line of N versus N (see Figure 30) shows that the increase factor equals N for $N = 1$ and is less than N for all $N > 1$. Thus, Statement A is proven.

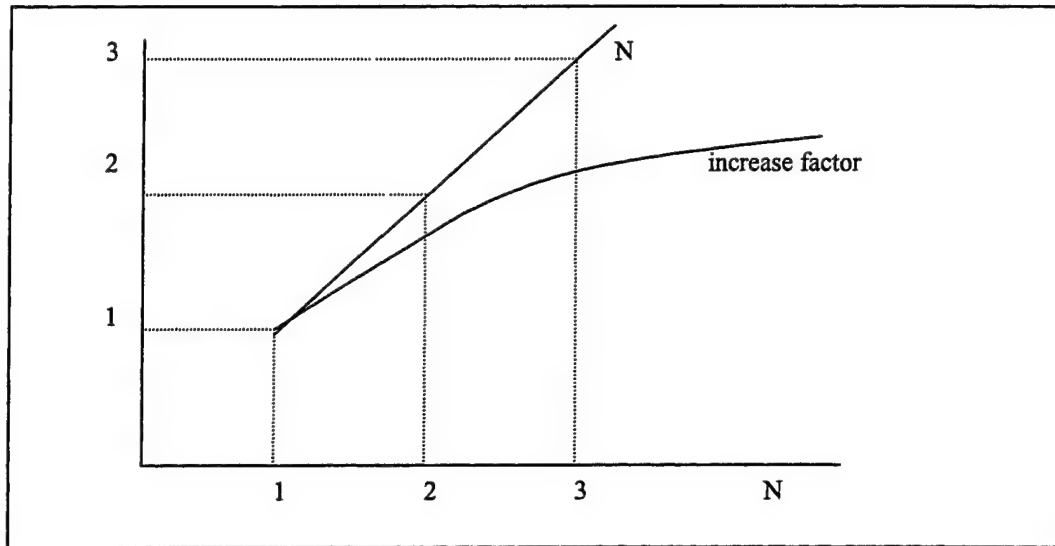


Figure 30. Comparing the Curve of the Increase Factor vs. N with the Straight Line of N vs. N.

To prove Statement B, we provide a theoretical explanation of why the impulse height shrinks when the damping time T becomes very large (close to 1200 seconds).

We observe that after Subroutine `APSM_MEASURED_MINUS_MODEL` is done, the measured-minus-modeled impulse magnitudes for each of the directions Y and Z have the same initial height for $T = 1200$ and $T = 60$, but disappear more quickly into the baseline for $T = 60$ than for $T = 1200$.

The next subroutine that `APSM.F` calls, namely `APSM_REMOVE_LARGE_JUMPS`, treats each impulse as a large jump (over 375 nT) and subtracts the same amount from the X-curve for the entire duration of the impulse, in an attempt to cause this impulse to vanish in magnitude. In most cases, this amount is approximately the initial impulse height. Hence, the subtracted amount is based on the initial impulse angle and therefore independent of the damping time T . Hence, it is the same for $T = 60$ as for $T = 1200$. A similar operation is done for curves Y and Z. This operation has the effect of turning the impulse upside-down and setting its left-hand end close to zero. Since the original impulse drops faster for $T = 60$ than for $T = 1200$, the inverted impulse rises faster for $T = 60$. Thus, its peak, now on its right-hand end, is higher for $T = 60$ than for $T = 1200$.

Although the large-jump removal is an important factor in reducing the impulse heights for $T = 1200$, the remaining routines that `APSM.F` calls produce the measurements that appear in the plots.

Statement C focuses on the width of the spike on the plot. In theory, this width is directly proportional to its duration `END_IMP` and thus independent of the damping time T , and the impulse resembles the left-hand figure in Figure 31 below. This figure is accurate when T is large, say $T = 60$. However, the closer T is to zero, the less time the impulse takes to return close to the baseline curve and the lower the amplitude is when the impulse ends after `END_IMP`.

seconds. When T is small enough, between 5 and 10, the impulse resembles the single pole in the right-hand figure below.

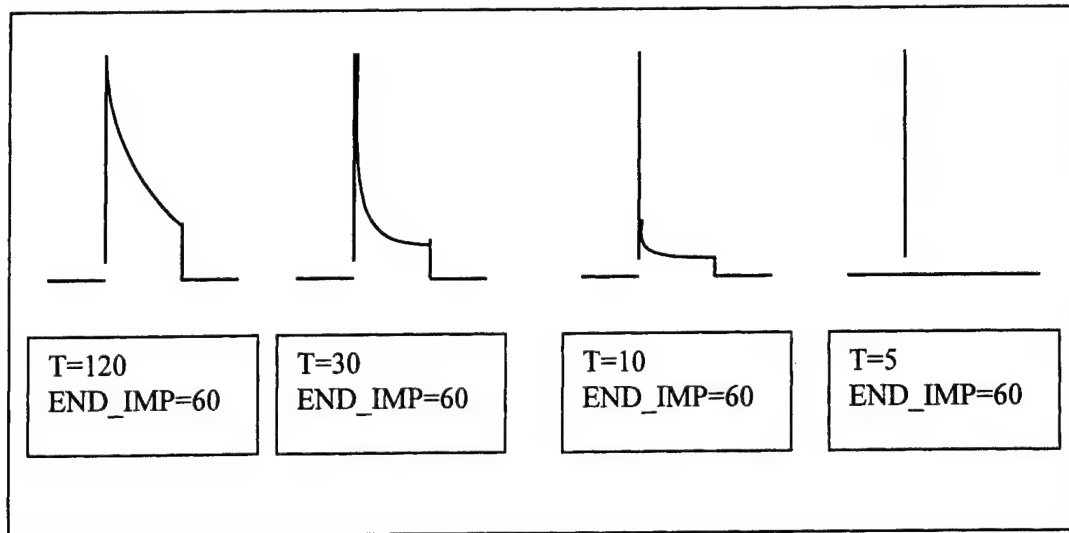


Figure 31. Effect of Damping Time on Impulse Spike Duration.

Thus, as T increases, the spikes split at the bottom. In addition, more data points are high enough from the baseline curve to be seen on the spikes, not on the baseline. Hence, the spikes are thicker. This proves Statement C.

4.9 Decomposing The Boom Effect

The goal of this Section is to express the effect of adding the boom as the sum of the three factors that conceivably twist the boom. These three factors are continual oscillation, sun-induced thermal twist, and impulse twist. This decomposition is done for each of the six sample days listed above in Section 4.5.1. From these results, conclusions are then deduced for the entire six-month period covered by the sample days. This decomposition is supposed to determine the effect of the behavior of the boom on the field strength.

For a mathematical definition of the boom effect and the three twists, see Sections 4.4.1 and 4.4.2 above. Section 4.9.1 details a method that decomposes the baseline curves analytically by a linear least-squares method. Section 4.9.2 discusses another method of decomposition: visually comparing plots of the baseline curves with graphs of the twist effects. Section 4.9.3 summarizes the results of this study.

The main results of this study are as follows: The method of visual inspection, especially when applied to the Fourier-transform (FT) plots, yields more information about the decomposition of the baseline than does the mathematical method. The FT plots indicate that the continual and thermal twists are the predominant twist components in the baseline curve.

4.9.1 Mathematical Decomposition of the Baseline Curves

It was first thought that a mathematical method would provide a precise decomposition of the baseline curve W . However, this method decomposes only a small part of W , leaving the rest as a combination of artifacts, noise, and other errors. Nevertheless, this method is illustrated here.

This Section is outlined as follows:

Section 4.9.1.1 introduces the least-squares equation used in the mathematical attempt at decomposition.

Section 4.9.1.2 records the least-squares solutions when the samples of magnetic fields are ordered by Universal Time, about one sample per second. Section 4.9.1.3 lists the solutions when these samples are ordered by satellite altitude. This reordering is done to see whether the altitude solutions reveal similarities not noticed in the time solutions. Similarly, Section 4.9.1.4 reorders the data points by latitude.

Section 4.9.1.5 rearranges them by amount of sunlight. This variable is set = 0 when the satellite crosses the day-night terminator from night to day, and = 1 when it passes from day to night. When the satellite does not cross the terminator, this variable is linearly interpolated between 0 and 1 according to the distance of the satellite from its closest night-to-day crossing point.

Section 4.9.1.6 repeats the analyses of Sections 4.9.1.2 through 4.9.1.5, but this time converting the magnetic field to its Fourier transform and plotting it over the time frequency, which has units of Hz ($= 1/\text{sec}$).

Section 4.9.1.7 summarizes the results of the above analysis.

4.9.1.1 The Least-Squares Equation

Since the goal of decomposition is to minimize the part of W that does not belong to a twist type, a linear least-squares method is used.

The boom effect ($F15_{\text{meas}} - F15_{\text{mod}}$), defined in Section 4.5.3 above, is computed for each axis (X, Y, and Z) for each of N data points, typically one second apart. The resulting vector with $3N$ components, when plotted, forms the baseline curve. This curve is then decomposed into its twist types by a linear least-squares solution of the equation:

$$W = c_T T_5 + c_I I_5 + \text{osc}(A, B, C) + R \quad (38)$$

for the set of five unknown scalar constants c_T , c_I , A , B , and C that minimizes the square norm $|R|_2$ of the residual R . $|R|_2$ is defined as the square root of the sum-of-squares of its $3N$ components. In other words, if $R = (r_1, r_2, \dots, r_{3N})$ then $|R|_2 = \text{SQRT}(r_1^2 + r_2^2 + \dots + r_{3N}^2)$. This residual theoretically contains artifacts, noise, and other errors.

W , T_5 , I_5 , $\text{osc}(A,B,C)$, and R are vectors, each with $3N$ components that correspond to axes X , Y , and Z for each of N data points.

W is the baseline vector, the boom effect ($F15_{\text{meas}} - F15_{\text{mod}}$) defined above, where:
 $F15_{\text{meas}}$ = measured-field vector for $F15$ with the above $3N$ components, and
 $F15_{\text{mod}}$ = modeled-field vector for $F15$ with the above $3N$ components.

The three twist types are T_5 , I_5 , and $\text{osc}(A,B,C)$ as defined below:

T_5 = effect of thermal twist of 5 degrees = $\text{THERM}_5 * F15_{\text{meas}} - F15_{\text{meas}}$,
 where $\text{THERM}_5 * F15_{\text{meas}}$ = the vector with the above $3N$ components that results from applying the 3×3 rotation matrix for $\text{PMAX} = 5$ degrees in `APSM_THERM.F` to each data point of $F15_{\text{meas}}$. Each data point is represented as a vector of 3 components corresponding to axes X , Y , and Z .

I_5 = impulse twist of 5 degrees = $\text{IMPUL}_5 * F15_{\text{meas}} - F15_{\text{meas}}$,
 where $\text{IMPUL}_5 * F15_{\text{meas}}$ = the vector with the above $3N$ components that results from applying the rotation matrix for $\text{PMAX} = 5$ degrees in `APSM_IMPUL.F` to each data point of $F15_{\text{meas}}$.

$\text{osc}(A,B,C)$ = estimated continual-oscillation twist of A , B , and C degrees. For each data point, this twist is approximated as the three-component vector:

$$[p(Cy - Bz), p(Az - Cx), p(Bx - Ay)], \text{ where} \quad (39)$$

$p = \pi/180$, the conversion factor from degrees to radians, and
 (x, y, z) = the three-component vector for one data point of $F15_{\text{meas}}$.

4.9.1.2 Field Versus Time

An IDL program was created to plot the magnetic field versus time for the $F15$ measured-minus-modeled (baseline), thermal, and impulse outputs. This program also performs the least-squared analysis described in Section 4.9.1.1 above, mathematically decomposing the baseline curve into its component twist types.

For each of the six sample days of data, Tables 12 through 23 list the solution coefficients c_T , c_I , A , B , and C that minimize the residue norm $|R|_2$. Below these coefficients also appear $|R|_2$ itself, the norm $|W|_2$ of the baseline vector W , and the ratio $|R|_2/|W|_2$ that provides a true measure of the non-decomposed part of W . The domain over which the field is plotted appears in the upper-left corner of the next twelve tables. For example, Table 12 contains its domain "Time" in its upper-left corner.

| TABLE 12. Coefficients of Components of the Baseline Curve as a Function of Time | | | | | | |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Time | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| c_T | 0.003256 | -0.009423 | -0.011347 | -0.034203 | -0.036265 | -0.023273 |
| c_I | -0.007086 | -0.014733 | 0.040358 | 0.027719 | 0.005215 | 0.000640 |
| A | -0.011169 | 0.035353 | 0.036364 | 0.138719 | 0.146984 | 0.070963 |
| B | -0.067365 | -0.003893 | 0.027024 | 0.021608 | 0.046335 | 0.053667 |
| C | 0.001566 | -0.011807 | -0.015181 | 0.074791 | 0.084324 | 0.035953 |
| $ R _2$ | 129.84918 | 140.16919 | 131.83162 | 136.17054 | 129.71414 | 139.08746 |
| $ W _2$ | 131.03552 | 141.10848 | 132.87787 | 139.87960 | 133.04027 | 140.09419 |
| $ R _2/ W _2$ | 0.990946 | 0.993343 | 0.992126 | 0.973484 | 0.974999 | 0.992814 |

The baseline curve and its component twists can be translated from the coefficients in the above table into units of NanoTesla (nT). The following example illustrates how this is done.

Running the prefile for Day 2000-050 through APSM with no twists (the baseline curve) yields W in its MFR (measured-minus-modeled field record) file. The maximum absolute value of the field in this file is 513 nT, 433 nT, and 509 nT for axes X, Y, and Z, respectively.

The next step is to obtain the magnitude of the thermal component of W. To do so, one must multiply the thermal coefficient c_T by the maximum absolute value of the field of the thermal twist T_5 of 5 degrees. Now:

$$\begin{aligned}
 T_5 &= \text{effect of thermal twist of 5 degrees} \\
 &= \text{THERM}_5 * F15_{\text{meas}} - F15_{\text{meas}} \\
 &= (\text{THERM}_5 * F15_{\text{meas}} - F15_{\text{mod}}) - (F15_{\text{meas}} - F15_{\text{mod}}) \\
 &= (\text{THERM}_5 * F15_{\text{meas}} - F15_{\text{mod}}) - W.
 \end{aligned} \tag{40}$$

The quantity $(\text{THERM}_5 * F15_{\text{meas}} - F15_{\text{mod}})$ appears in the MFR file that results by running Day 2000-050 through APSM with the call to Subroutine APSM_THERMAL turned on and PMAX set to 5.0*DEG_TO_RAD in Subroutine APSM_THERMAL. The field values of the baseline-curve MFR file, which form W, are then subtracted from those of the thermal-twist MFR file. The maximum absolute value of the resulting field is 1624 nT, 3602 nT, and 4687 nT for axes X, Y, and Z, respectively. Multiplying these three values by the absolute value of the thermal-twist coefficient $|c_T| = 0.003256$ yields the magnitude (5.28774 nT, 11.7281 nT, 15.2609 nT) of the thermal-twist component in the baseline curve.

Similarly, once the continual-twist angles A, B, and C are known, $\text{osc}(A,B,C)$ can be written as:

$$\begin{aligned}
 \text{osc}(A,B,C) &= \text{effect of continual twist with angles A, B, and C} \\
 &= \text{OSC}_{A,B,C} * F15_{\text{meas}} - F15_{\text{meas}} \\
 &= (\text{OSC}_{A,B,C} * F15_{\text{meas}} - F15_{\text{mod}}) - (F15_{\text{meas}} - F15_{\text{mod}}) \\
 &= (\text{OSC}_{A,B,C} * F15_{\text{meas}} - F15_{\text{mod}}) - W,
 \end{aligned} \tag{41}$$

where $\text{OSC}_{A,B,C}$ = the rotation matrix

where $\text{OSC}_{A,B,C} * F15_{\text{meas}}$ = the vector with 3N components that results from applying the 3x3 rotation matrix for angles A, B, and C degrees in Subroutine APSM_OSCILLATION to each data point of $F15_{\text{meas}}$. One should run Day 2000-050 through APSM with the call to

APSM_OSCILLATION turned on and the angles (A, B, C) in this subroutine set to (-0.011169 deg, -0.067365 deg, 0.001566 deg) as indicated in the above table. Taking the field values in the resulting MFR file and subtracting those of W yield the continual-twist effect. Its maximum absolute values are 14 nT, 3 nT, and 53 nT for axes X, Y, and Z, respectively. They do not need to be multiplied by any coefficient, since osc(A,B,C) has none in the equation:

$$W = c_T T_5 + c_I I_5 + \text{osc}(A,B,C) + R. \quad (42)$$

The measurements (in nT) of **maximum** absolute value of magnetic field in the baseline curve and in its component twists appear in the Table 13.

| TABLE 13. Maximum Contributions of Components of the Baseline Curve as a Function of Time | | | | | | | |
|--|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Maximum absolute value of field over time | | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| Baseline (= W) | X | 513 | 523 | 521 | 519 | 541 | 542 |
| | Y | 433 | 506 | 494 | 547 | 641 | 973 |
| | Z | 509 | 703 | 447 | 613 | 444 | 677 |
| Thermal part of W | X | 5.28774 | 13.7576 | 17.3609 | 55.4773 | 60.3812 | 36.8179 |
| | Y | 11.7281 | 36.6743 | 42.7782 | 122.447 | 129.140 | 85.2490 |
| | Z | 15.2609 | 41.3199 | 45.3199 | 142.832 | 152.784 | 94.7909 |
| Impulse part of W | X | 16.4324 | 34.4169 | 91.4109 | 66.0267 | 11.2488 | 1.50336 |
| | Y | 23.0082 | 54.3500 | 144.159 | 106.441 | 17.5850 | 2.21952 |
| | Z | 31.2422 | 60.7442 | 147.872 | 108.354 | 21.3085 | 2.41344 |
| Continual -twist part of W | X | 14 | 6 | 10 | 37 | 43 | 22 |
| | Y | 3 | 13 | 16 | 74 | 82 | 37 |
| | Z | 53 | 17 | 27 | 67 | 78 | 53 |

For Day 2000-050, the impulse and continual twists are stronger components of the baseline curve than is the thermal twist. For Days 2000-083 and 2000-116, the strongest component is the impulse twist, which because of its spikes, is more prevalent in Table 13 than in the Table 14, that lists the average field intensities. For the remaining three days, the thermal twist is strongest.

The measurements (in nT) of **average** absolute value of magnetic field in the baseline curve and in its component twists appear in the Table 14.

TABLE 14. Average Contributions of Components of the Baseline Curve as a Function of Time

| Average absolute value of field over time | | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
|---|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Baseline (= W) | X | 141.543 | 144.394 | 146.038 | 142.480 | 138.339 | 146.486 |
| | Y | 88.2904 | 109.094 | 88.3712 | 97.5812 | 94.5259 | 96.4692 |
| | Z | 82.1530 | 83.2034 | 80.8719 | 93.1343 | 83.1404 | 81.6874 |
| Thermal part of W | X | 1.93118 | 5.32780 | 6.59117 | 19.4813 | 20.7803 | 13.3036 |
| | Y | 3.41671 | 10.9594 | 12.7251 | 38.6269 | 41.7518 | 26.3020 |
| | Z | 4.19699 | 12.1972 | 15.4678 | 45.6573 | 48.8749 | 31.3868 |
| Impulse part of W | X | 0.10160 | 0.09452 | 0.38505 | 0.20242 | 0.05088 | 0.00465 |
| | Y | 0.24251 | 1.98383 | 1.46565 | 4.13785 | 0.26929 | 0.03478 |
| | Z | 0.36439 | 1.29340 | 2.94734 | 0.93750 | 0.30873 | 0.04604 |
| Continual-twist part of W | X | 4.80394 | 2.63877 | 3.86903 | 16.6782 | 18.8624 | 8.64912 |
| | Y | 1.11646 | 5.47576 | 7.17997 | 34.0360 | 38.3940 | 16.3082 |
| | Z | 30.1159 | 8.10999 | 14.6066 | 32.2747 | 38.8426 | 28.9119 |

For Day 2000-050, the continual twist is predominant. For the remaining days, the thermal twist is strongest.

The coefficients c_T , c_I , A, B, and C tabulated in the "Time" table above determine how well W can be decomposed into its component twists. Since the thermal and impulse twists T_5 and I_5 are taken at 5 degrees, their true effect is 5 times their coefficients c_T and c_I . Thus, for (say) Day 2000-050, the oscillation in W is made up as follows:

Thermal: 12.4 percent
 Impulse: 26.9 percent
 Continual oscillation: 60.8 percent, composed of:
 Angle A: 8.5 percent
 Angle B: 51.1 percent
 Angle C: 1.2 percent

Because of roundoff error, the above percentages add up to 100.1 percent.

According to the coefficient values, the predominant twist in the baseline curve for Day 2000-050 is Angle B of the continual twist. For Days 2000-083 and 2000-116, the impulse twist is strongest. For the remaining three days, the thermal twist prevails. These findings match the pattern of prevalent twists for the maximum absolute value of the field in nT.

The results in Table 14 above, and in all tables that record $|R|_2$ and $|W|_2$, show that $|R|_2$ is always between 95 percent and 100 percent of $|W|_2$. This proximity strongly suggests that for most days between Days 2000-050 and 2000-215, if not all, R and W are almost equal, most often less than 10 percent different and pointing in the same direction. Hence, the sum (W - R) of the twist types contains very little of these types. Thus, it is difficult to decompose W into the various twist types using the field-versus-time coefficients.

4.9.1.3 Field Versus Altitude

Another IDL program was designed to solve the least-squares equation for the field versus satellite altitude in the hope that these results, more than the conventional field-versus-time solutions, can reveal the makeup of oscillation types present in the field of W. This IDL program uses the QuickSort algorithm found on the *MVPS Website* [1997].

Table 15 lists the solutions and residual of field versus altitude.

| TABLE 15. Coefficients of Components of the Baseline Curve as a Function of Altitude | | | | | | |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Altitude | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| c_T | -0.004284 | -0.007883 | -0.004026 | -0.005560 | -0.013783 | -0.008057 |
| c_I | 0.008875 | -0.010954 | 0.000554 | 0.008374 | 0.004035 | 0.001526 |
| A | 0.008441 | 0.013938 | 0.005814 | 0.061581 | 0.077105 | 0.014209 |
| B | -0.049876 | -0.013794 | -0.004744 | -0.066536 | -0.023461 | 0.005900 |
| C | 0.016323 | -0.021543 | -0.039356 | 0.004228 | 0.019296 | -0.005968 |
| $ R _2$ | 129.79314 | 140.07472 | 132.01088 | 137.77392 | 131.03256 | 139.64188 |
| $ W _2$ | 131.03476 | 141.10734 | 132.87704 | 139.87878 | 133.03949 | 140.09336 |
| $ R _2/ W _2$ | 0.990525 | 0.992682 | 0.993482 | 0.984952 | 0.984915 | 0.996777 |

Again, $|R|_2$ is always a bit less than $|W|_2$. Hence, the field-versus-altitude solution does not break down a significant part of W.

In the altitude domain, as in the time domain, the baseline curve and its component twists can be translated from the coefficients in the above table into units of NanoTesla (nT). The measurements (in nT) of **maximum** absolute value of magnetic field in the baseline curve and in its component twists appear in Table 16 below.

| TABLE 16. Maximum Contributions of Components of the Baseline Curve as a Function of Altitude | | | | | | | |
|---|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Maximum abs. value of field over altitude | | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| Baseline (= W) | X | 513 | 523 | 521 | 519 | 541 | 542 |
| | Y | 433 | 506 | 494 | 547 | 641 | 973 |
| | Z | 509 | 703 | 447 | 613 | 444 | 677 |
| Thermal part of W | X | 6.95722 | 11.5092 | 6.15978 | 9.01832 | 22.9487 | 12.7462 |
| | Y | 15.4310 | 30.6806 | 15.1780 | 19.9048 | 49.0813 | 29.5128 |
| | Z | 20.0791 | 34.5670 | 16.0798 | 23.2186 | 58.0678 | 32.8162 |
| Impulse part of W | X | 20.5811 | 25.5885 | 1.25481 | 19.9469 | 8.70350 | 3.58457 |
| | Y | 28.8171 | 40.4093 | 1.97889 | 32.1562 | 13.6060 | 5.29217 |
| | Z | 39.1299 | 45.1633 | 2.02986 | 32.7340 | 16.4870 | 5.75455 |
| Continual -twist part of W | X | 13 | 12 | 19 | 14 | 11 | 4 |
| | Y | 13 | 17 | 31 | 16 | 28 | 6 |
| | Z | 39 | 13 | 5 | 60 | 41 | 8 |

For Days 2000-050 and 2000-083, the impulse twist is the strongest component among the three twists in the baseline curve. For Days 2000-116 and 2000-149, the strongest component is the continual twist. For the remaining two days the thermal twist is strongest.

The measurements (in nT) of **average** absolute value of magnetic field in the baseline curve and in its component twists appear in the Table 17.

| TABLE 17. Average Contributions of Components of the Baseline Curve as a Function of Altitude | | | | | | | |
|--|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Average abs. value of field over altitude | | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| Baseline (= W) | X | 141.543 | 144.394 | 146.038 | 142.480 | 138.339 | 146.486 |
| | Y | 88.2904 | 109.094 | 88.3712 | 97.5812 | 94.5259 | 96.4692 |
| | Z | 82.1530 | 83.2034 | 80.8719 | 93.1343 | 83.1404 | 81.6874 |
| Thermal part of W | X | 2.54090 | 4.45708 | 2.33860 | 3.16686 | 7.89784 | 4.60562 |
| | Y | 4.49545 | 9.16832 | 4.51497 | 6.27915 | 15.8683 | 9.10563 |
| | Z | 5.52209 | 10.2038 | 5.48808 | 7.42200 | 18.5756 | 10.8660 |
| Impulse part of W | X | 0.12725 | 0.07027 | 0.00529 | 0.06115 | 0.03937 | 0.01108 |
| | Y | 0.30374 | 1.47498 | 0.02012 | 1.25006 | 0.20836 | 0.08293 |
| | Z | 0.45638 | 0.96165 | 0.04046 | 0.28322 | 0.23887 | 0.10977 |
| Continual -twist part of W | X | 4.99973 | 4.88692 | 8.86488 | 4.81014 | 4.57254 | 1.38064 |
| | Y | 7.28034 | 9.53602 | 17.6743 | 4.12963 | 9.34535 | 2.81432 |
| | Z | 22.3101 | 7.00565 | 2.50148 | 32.9908 | 20.0380 | 4.13488 |

For Days 2000-050, 2000-116, and 2000-149, the continual twist is the strongest component among the three twists in the baseline curve. For the other three days the thermal twist is strongest. Like in field-over-time, the impulse twist in field-over-altitude is more prevalent among the maximum field intensities than among the average intensities.

According to the coefficient values, the predominant twist in the baseline curve for Days 2000-050 and 2000-149 is Angle B of the continual twist. For Days 2000-083, the impulse twist is strongest. For Day 2000-116, Angle C of the continual twist prevails. For Day 2000-182 it is Angle A of the continual twist. For Day 2000-215 it is the thermal twist. These findings somewhat resemble the pattern of prevalent twists for both the maximum and average absolute values of the field in nT.

4.9.1.4 Field Versus Latitude

Another IDL program was developed to decompose the baseline curve of the field versus satellite latitude.

This program uses the QuickSort algorithm found on the *MVPS Website* [1997].

Table 18 lists the solutions and residual of field versus latitude.

| TABLE 18. Coefficients of Components of the Baseline Curve as a Function of Latitude | | | | | | |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Latitude | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| c_T | -0.000140 | -0.009422 | -0.011345 | -0.034204 | -0.032898 | -0.017275 |
| c_I | -0.004560 | -0.014734 | 0.040353 | 0.027719 | 0.004600 | -0.008379 |
| A | -0.000449 | 0.035349 | 0.036360 | 0.138721 | 0.127113 | 0.031651 |
| B | -0.058823 | -0.003897 | 0.027020 | 0.021610 | 0.036382 | 0.035385 |
| C | 0.009281 | -0.011810 | -0.015184 | 0.074792 | 0.074482 | 0.016726 |
| $ R _2$ | 129.86863 | 140.16810 | 131.83085 | 136.16958 | 129.80194 | 139.10287 |
| $ W _2$ | 131.03476 | 141.10734 | 132.87704 | 139.87878 | 133.03949 | 140.09336 |
| $ R _2/ W _2$ | 0.991101 | 0.993344 | 0.992127 | 0.973483 | 0.975665 | 0.992930 |

Again, the field-versus-latitude coefficients do not properly decompose W.

The measurements (in nT) of **maximum** absolute value of magnetic field in the baseline curve and in its component twists appear in Table 19.

| TABLE 19. Maximum Contributions of Components of the Baseline Curve as a Function of Latitude | | | | | | | |
|---|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Maximum abs. value of field over latitude | | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| Baseline (= W) | X | 513 | 523 | 521 | 519 | 541 | 542 |
| | Y | 433 | 506 | 494 | 547 | 641 | 973 |
| | Z | 509 | 703 | 447 | 613 | 444 | 677 |
| Thermal part of W | X | 0.227360 | 13.7561 | 17.3579 | 55.4789 | 54.7752 | 27.3291 |
| | Y | 0.504280 | 36.6704 | 42.7707 | 122.450 | 117.150 | 63.2783 |
| | Z | 0.656180 | 41.3155 | 45.3119 | 142.836 | 138.599 | 70.3611 |
| Impulse part of W | X | 10.5746 | 34.4186 | 91.3995 | 66.0267 | 9.92220 | 19.6823 |
| | Y | 14.8063 | 54.3537 | 144.141 | 106.441 | 15.5112 | 29.0584 |
| | Z | 20.1050 | 60.7483 | 147.853 | 108.354 | 18.7956 | 31.5972 |
| Continual -twist part of W | X | 13 | 6 | 10 | 37 | 38 | 11 |
| | Y | 8 | 13 | 16 | 74 | 72 | 17 |
| | Z | 46 | 17 | 27 | 67 | 66 | 32 |

For Day 2000-050, the continual twist is the strongest component among the three twists in the baseline curve. For Days 2000-083 and 2000-116, the strongest component is the impulse twist. For the remaining three days the thermal twist is strongest.

The measurements (in nT) of **average** absolute value of magnetic field in the baseline curve and in its component twists appear in Table 20.

| TABLE 20. Average Contributions of Components of the Baseline Curve as a Function of Latitude | | | | | | | |
|--|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Average abs. value of field over latitude | | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| Baseline (= W) | X | 141.543 | 144.394 | 146.038 | 142.480 | 138.339 | 146.486 |
| | Y | 88.2904 | 109.094 | 88.3712 | 97.5812 | 94.5259 | 96.4692 |
| | Z | 82.1530 | 83.2034 | 80.8719 | 93.1343 | 83.1404 | 81.6874 |
| Thermal part of W | X | 0.08304 | 5.32723 | 6.59001 | 19.4819 | 18.8510 | 9.87491 |
| | Y | 0.14691 | 10.9583 | 12.7229 | 38.6280 | 37.8754 | 19.5234 |
| | Z | 0.18046 | 12.1959 | 15.4651 | 45.6586 | 44.3372 | 23.2977 |
| Impulse part of W | X | 0.06538 | 0.09452 | 0.38500 | 0.20242 | 0.04488 | 0.06085 |
| | Y | 0.15606 | 1.98396 | 1.46547 | 4.13785 | 0.23753 | 0.45538 |
| | Z | 0.23449 | 1.29349 | 2.94698 | 0.93749 | 0.27232 | 0.60270 |
| Continual -twist part of W | X | 4.57962 | 2.63952 | 3.86947 | 16.6784 | 16.6229 | 4.32892 |
| | Y | 4.13835 | 5.47652 | 7.18092 | 34.0364 | 33.9047 | 7.58078 |
| | Z | 26.2112 | 8.10955 | 14.6050 | 32.2754 | 32.7290 | 17.4400 |

For Day 2000-050, the continual twist is the strongest component among the three twists in the baseline curve. For the remaining days the thermal twist is strongest. Like in field-over-time, the impulse twist in field-over-latitude is more prevalent among the maximum field intensities than among the average intensities.

According to the coefficient values, the predominant twist in the baseline curve for Day 2000-050 is Angle B of the continual twist. For Days 2000-083 and 2000-116, the impulse twist is strongest. For the remaining three days, the thermal twist prevails. These findings match the pattern of prevalent twists for the maximum absolute value of the field in nT and for the coefficient values of the field-over-time plots.

4.9.1.5 Field Versus Sunlight

The next step is to decompose the baseline curve of the field versus sunlight, or "time spent in the Sun." The sunlight domain is important: since the thermal twist depends on the amount of sunlight, as defined below, the field-versus-sunlight plots can easily reveal similarities between the baseline and the thermal twist that the other domains (time, altitude, and latitude) fail to notice.

The amount of sunlight is a variable equal to 0 when the satellite crosses from night to day, and equal to 1 when it crosses from day to night. At all other times, this variable is interpolated linearly over time. For example, when the satellite is 1/4 of the way through the day Section of its orbit, the sunlight value = 1/4. At 1/3 of the way through its night Section, the sunlight value = 2/3.

This program uses the QuickSort algorithm found on the *MVPS Website* [1997].

Table 21 lists the solutions and residual of the field-versus-sunlight plots.

| TABLE 21. Coefficients of Components of the Baseline Curve as a Function of Sunlight | | | | | | |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Sunlight | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| c_T | -0.013399 | -0.020636 | -0.011347 | -0.023001 | -0.018286 | -0.013833 |
| c_I | 0.003126 | -0.003313 | 0.040358 | 0.021646 | 0.001532 | -0.008150 |
| A | 0.026625 | 0.028225 | 0.036364 | 0.045331 | 0.049778 | 0.013781 |
| B | -0.028032 | 0.019037 | 0.027024 | -0.034246 | -0.025193 | 0.016245 |
| C | 0.032050 | 0.000705 | -0.015181 | 0.031024 | 0.024613 | 0.005323 |
| $ R _2$ | 129.17580 | 138.55130 | 131.83080 | 135.30046 | 129.97349 | 139.05892 |
| $ W _2$ | 131.03476 | 141.10734 | 132.87704 | 139.87878 | 133.03949 | 140.09336 |
| $ R _2/ W _2$ | 0.985813 | 0.981886 | 0.992126 | 0.967269 | 0.976954 | 0.992616 |

Again, the field-versus-sunlight solution does not properly decompose W.

The measurements (in nT) of **maximum** absolute value of magnetic field in the baseline curve and in its component twists appear in Table 22.

| TABLE 22. Maximum Contributions of Baseline Curve Components as a Function of Sunlight | | | | | | | |
|---|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Maximum abs. value of field over sunlight | | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| Baseline (= W) | X | 513 | 523 | 521 | 519 | 541 | 542 |
| | Y | 433 | 506 | 494 | 547 | 641 | 973 |
| | Z | 509 | 703 | 447 | 613 | 444 | 677 |
| Thermal part of W | X | 21.7600 | 30.1286 | 17.3609 | 37.3076 | 30.4462 | 21.8838 |
| | Y | 48.2632 | 80.3153 | 42.7782 | 82.3436 | 65.1164 | 50.6703 |
| | Z | 62.8011 | 90.4889 | 45.3199 | 96.0522 | 77.0389 | 56.3418 |
| Impulse part of W | X | 7.24919 | 7.73917 | 91.4109 | 51.5608 | 3.30452 | 19.1444 |
| | Y | 10.1501 | 12.2217 | 144.159 | 83.1206 | 5.16590 | 28.2642 |
| | Z | 13.7825 | 13.6595 | 147.872 | 84.6142 | 6.25975 | 30.7337 |
| Continual -twist part of W | X | 17 | 4 | 10 | 17 | 14 | 5 |
| | Y | 27 | 7 | 16 | 29 | 25 | 6 |
| | Z | 30 | 20 | 27 | 35 | 31 | 15 |

For Days 2000-116 and 2000-149, the impulse twist is the strongest component among the three twists in the baseline curve. For Day 2000-149, the thermal twist is close behind. For the remaining days, the thermal twist is strongest.

The measurements (in nT) of **average** absolute value of magnetic field in the baseline curve and in its component twists appear in Table 23.

| TABLE 23. Average Contributions of Baseline Curve Components as a Function of Sunlight | | | | | | | |
|---|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Average abs. value of field over sunlight | | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| Baseline (= W) | X | 141.543 | 144.394 | 146.038 | 142.480 | 138.339 | 146.486 |
| | Y | 88.2904 | 109.094 | 88.3712 | 97.5812 | 94.5259 | 96.4692 |
| | Z | 82.1530 | 83.2034 | 80.8719 | 93.1343 | 83.1404 | 81.6874 |
| Thermal part of W | X | 7.94714 | 11.6677 | 6.59117 | 13.1009 | 10.4781 | 7.90736 |
| | Y | 14.0603 | 24.0007 | 12.7251 | 25.9760 | 21.0526 | 15.6334 |
| | Z | 17.2713 | 26.7113 | 15.4678 | 30.7038 | 24.6443 | 18.6557 |
| Impulse part of W | X | 0.04482 | 0.02125 | 0.38505 | 0.15807 | 0.01495 | 0.05918 |
| | Y | 0.10699 | 0.44610 | 1.46565 | 3.23128 | 0.07911 | 0.44293 |
| | Z | 0.16075 | 0.29085 | 2.94734 | 0.73210 | 0.09070 | 0.58623 |
| Continual-twist part of W | X | 7.44086 | 1.61177 | 3.86903 | 7.26641 | 5.73103 | 1.58320 |
| | Y | 14.3131 | 2.32320 | 7.17997 | 14.0604 | 11.2852 | 2.44307 |
| | Z | 13.9682 | 10.4054 | 14.6066 | 18.4449 | 15.7481 | 7.94300 |

For all six days, the thermal twist is the strongest component among the three twists in the baseline curve. Like in field-over-time, the impulse twist in field-over-sunlight is more prevalent among the maximum field intensities than among the average intensities.

According to the coefficient values, the predominant twist in the baseline curve for Day 2000-116 is the impulse twist. For the remaining days, the thermal twist is strongest, with the impulse twist close behind for Day 2000-149. These findings strongly resemble the pattern of prevalent twists for the maximum absolute value of the field in nT.

4.9.1.6 Fourier Transform of Field Versus Time Frequency

Now that W is decomposed well in none of the above domains, we resort to the Fourier transform (FT) of the field versus the frequency domain corresponding to time. Several more IDL programs perform this decomposition.

The purpose of the FT plots is to uncover patterns that the non-FT plots can not reveal. These patterns include similarities or differences between the baseline curve and each of the three twists (continual, thermal, and impulse). In this way, one can conclude something like this: 40 percent of the baseline curve is composed of a continual twist with angles (0.4, 0.1, -0.5) degrees, a 3.4-degree thermal twist, and a 0.15-degree impulse twist. 60 percent of the baseline curve is residual (artifacts, noise, etc). Moreover, since the magnetic-field curve is roughly orbit-periodic over time, its FT is theoretically a simple composite of delta functions, from which conclusions can be easily drawn.

The FT of a given function $x(t)$ is defined in [Proakis and Salehi, 1994], Page 72, as:

$$X(f) = \int_{-\infty}^{\infty} x(t)e^{-j2\pi ft} dt, \quad (43)$$

where j = the complex number with real part zero and imaginary part 1,
 f = the frequency variable, and
 $X(f)$ = the FT of $x(t)$.

To illustrate the ability of the FT to reveal similarities between two functions, the graphs of the following functions are shown in Figure 32 for t between 0 and 2π :

$$f_0(t) = 1$$

$$f_1(t) = \cos(t)$$

$$f_2(t) = \cos(2t)$$

$$x(t) = 0.5 + \cos(t) + \cos(2t), \text{ and}$$

$$y(t) = 0.5 + \cos(t) - \cos(2t)$$

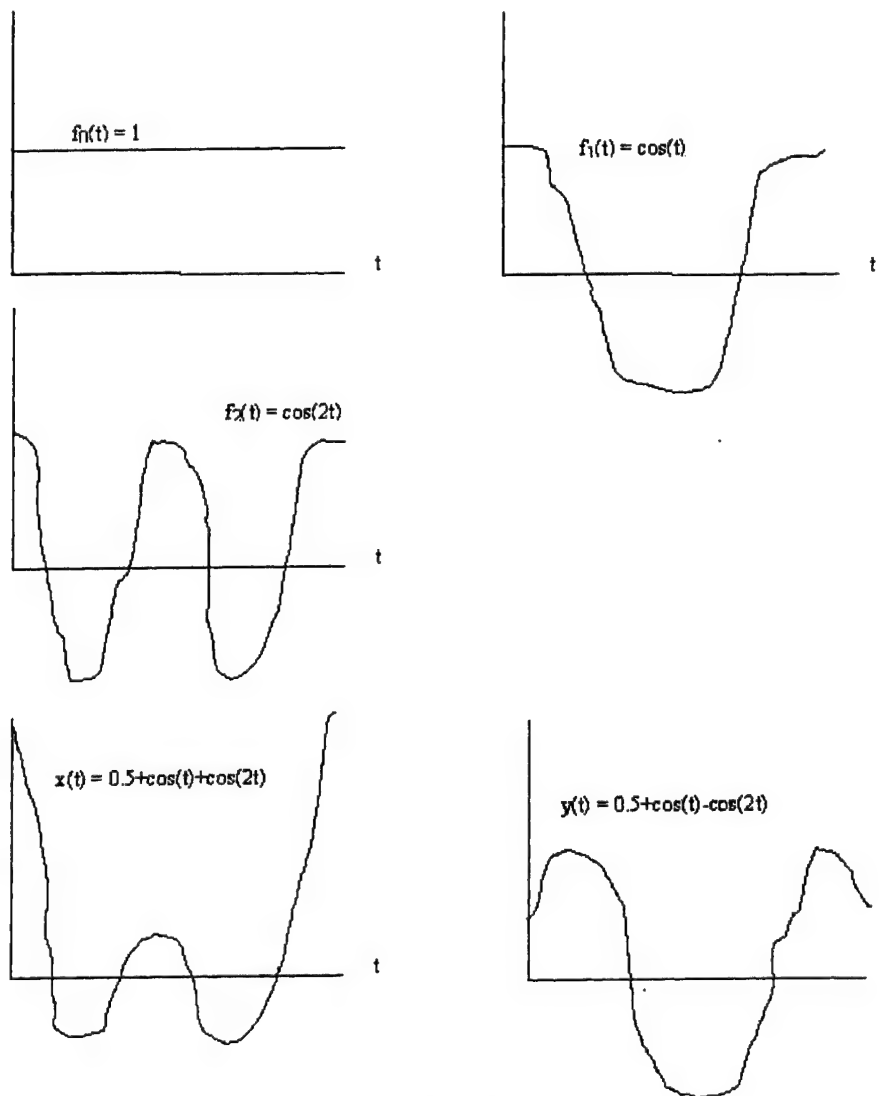
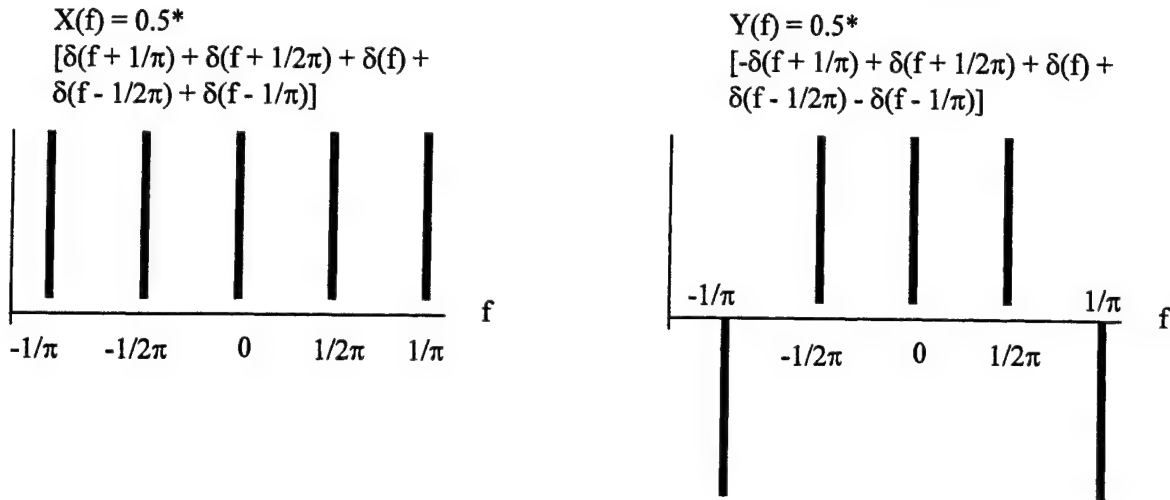


Figure 32. Usefulness of the Fourier Transform (I).

It is not at all apparent that the difference between $x(t)$ and $y(t)$ is $2\cos(2t)$. This effect is even more confusing when the functions $\cos(nt)$ are added together for more values of n . However,

from their respective Fourier transforms $X(f)$ and $Y(f)$ in Figure 33, this difference becomes clear.



where for any value f_0 , $\delta(f-f_0)$ is the delta ("impulse") function that is infinite at $f = f_0$ and zero for all other values of f . In these graphs, f_0 is set to $-1/\pi$, $-1/2\pi$, 0 , $1/2\pi$, and $1/\pi$.

Figure 33. Usefulness of the Fourier Transform (II).

Now we compare two functions $b(t)$ and $h(t)$ for the baseline and heat (thermal) curves, respectively, expressing them in the form:

$$b(t) = \sum_{n \in S} s_n e^{-j2\pi n t} + \sum_{n \in D} b_n e^{-j2\pi n t} \quad (44)$$

$$h(t) = \sum_{n \in S} s_n e^{-j2\pi n t} + \sum_{n \in D} h_n e^{-j2\pi n t} \quad (45)$$

where:

S (for "Same") is the set that contains each value of "n" whose coefficient s_n is the approximately the same (up to a 20% difference) for $b(t)$ and $h(t)$, and

D (for "Different") is the set with each "n" whose coefficients b_n for $b(t)$ and h_n for $h(t)$ are quite different.

Since the same phenomena repeat themselves each time the satellite orbits the Earth, $b(t)$ and $h(t)$ are themselves orbit-periodic. Thus, in many cases, we can assume that S is not much smaller than D. Now suppose that S is larger than D. Then the graphs of their FTs $B(f)$ and $H(f)$ resemble the left-hand and right-hand diagrams in Figure 34.

Please note that $B(f)$ and $H(f)$ are each a sum of delta functions $\delta(f-f_0)$ for thousands of values of f_0 , and the discrete FT was used so that $\delta(f-f_0)$ is finite for $f = f_0$. Hence, these plots, unlike the delta-function plots drawn above, resemble regular functions.

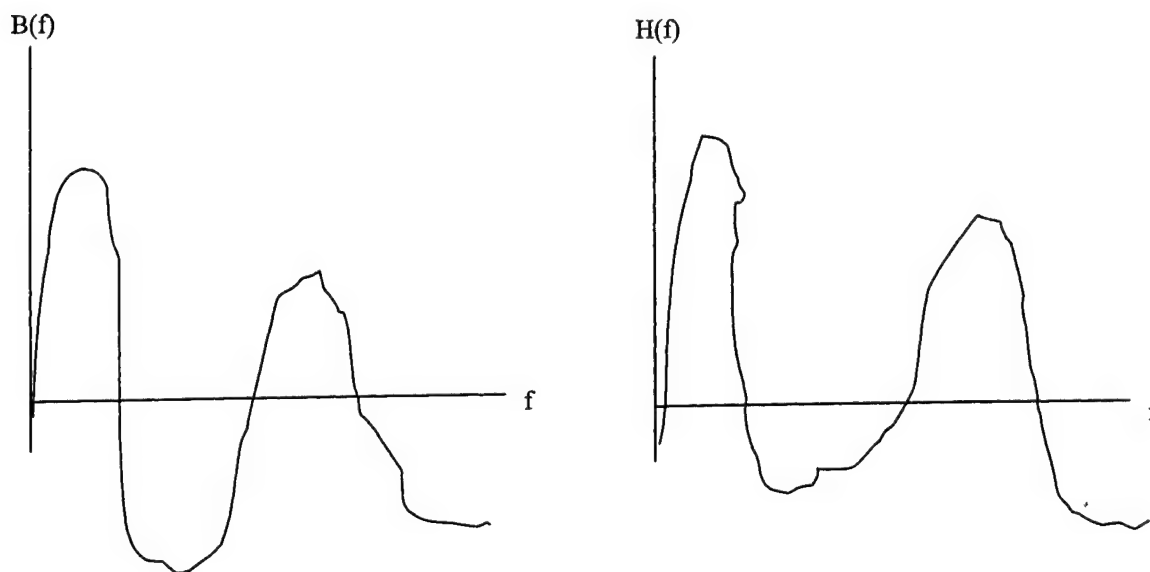


Figure 34. Usefulness of the Fourier Transform (III).

Here, one can clearly see that $B(f)$ and $H(f)$ are quite similar! Furthermore, since the FT is reversible, the original functions $b(t)$ and $h(t)$ are just as similar. However, the plots of the original functions $b(t)$ and $h(t)$ hide their similarities, as shown below:

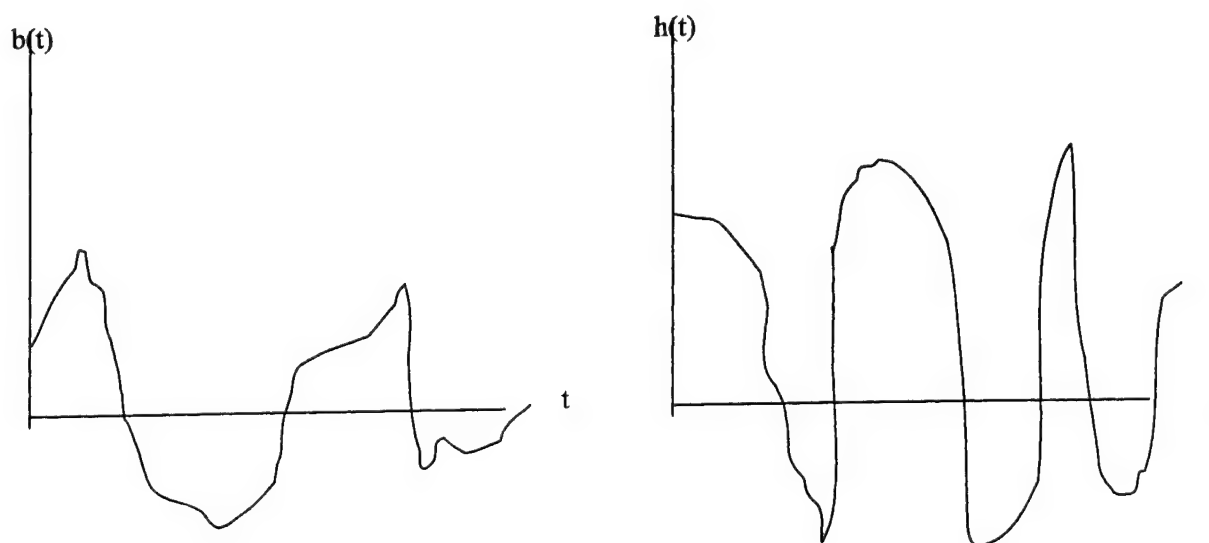


Figure 35. Usefulness of the Fourier Transform (IV).

The above discussion shows that the FT is often needed to find out whether two given periodic functions are similar.

The IDL programs that decompose W over the FT of field utilize IDL-language translations of the FORTRAN routines FOUR1 and REALFT in *Press, et al.* [1986], Pages 394 and 400, respectively. Together, these routines compute the Fast Fourier Transform (FFT) of a given function expressed as pairs of data points $(t_i, f(t_i))$ where $1 \leq i \leq 2^P$ and P is an integer. The FFT utilizes a numerical version of the above equation (see [*Press, et al.*, 1986], Page 389), and requires equally spaced t_i 's. The times listed in the MFR file are about 1 second apart. Those seconds (t_i) skipped in the MFR file are filled in with their corresponding interpolated values $f(t_i)$ of magnetic-field strength.

Tables 24 and 25 below list the solutions and residual of the field-versus-FT plots, using the results of the FFT described above. Two tables are required: one for the real coefficients of the FT, and another for its imaginary coefficients.

| TABLE 24. Real FFT-Derived Coefficients of Baseline Curve Components as a Function of Time | | | | | | |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Time FT (real coefs) | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| c_T | 0.024941 | -0.000765 | -0.008324 | -0.017983 | -0.014665 | -0.005465 |
| c_I | -0.057860 | -0.043390 | -0.003359 | 0.039913 | 0.002163 | -0.019795 |
| A | -0.000017 | 0.000044 | -0.000003 | -0.000020 | 0.000007 | 0.000047 |
| B | -0.112628 | -0.044195 | -0.010934 | -0.033720 | -0.004875 | 0.031291 |
| C | -0.066608 | -0.012889 | -0.033304 | 0.004479 | 0.044570 | 0.026787 |
| $ R _2$ | 37015.7 | 37180.9 | 40462.4 | 42895.7 | 38697.7 | 40666.5 |
| $ W _2$ | 38307.8 | 37528.1 | 41026.4 | 44195.4 | 39198.0 | 40787.6 |
| $ R _2/ W _2$ | 0.966270 | 0.990747 | 0.986252 | 0.970591 | 0.987238 | 0.997032 |

| TABLE 25. Imaginary FFT-Derived Coefficients of Baseline Curve Components as a Function of Time | | | | | | |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Time FT (img coefs) | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| c_T | 0.008351 | 0.001117 | -0.004396 | -0.005962 | -0.011717 | -0.008683 |
| c_I | 0.011366 | 0.019722 | -0.025112 | -0.002723 | 0.013365 | 0.004079 |
| A | -0.000036 | 0.000145 | 0.000038 | -0.000032 | 0.000052 | 0.000012 |
| B | -0.088334 | -0.058866 | -0.004476 | -0.048176 | -0.007527 | 0.044058 |
| C | -0.058951 | -0.032724 | -0.059089 | -0.029560 | 0.034862 | 0.057468 |
| $ R _2$ | 34728.6 | 26021.9 | 41571.2 | 47140.9 | 40528.7 | 44489.5 |
| $ W _2$ | 35683.3 | 27124.1 | 42584.0 | 48355.0 | 41624.0 | 45039.3 |
| $ R _2/ W _2$ | 0.973245 | 0.959365 | 0.976216 | 0.974893 | 0.973686 | 0.987793 |

The above field-frequency solutions do not properly decompose W .

The measurements (in nT) of **maximum** absolute value of magnetic field in the baseline curve and in its component twists appear in the Tables 26 and 27 below. Table 26 corresponds to the real part of the FFT, and the Table 27 to the imaginary part.

TABLE 26. Real FFT-Derived Maximum Contributions of Baseline Curve Components as a Function of Time

| Maximum abs. value of field over time FT, real | | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
|--|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Baseline (= W) | X | 513 | 523 | 521 | 519 | 541 | 542 |
| | Y | 433 | 506 | 494 | 547 | 641 | 973 |
| | Z | 509 | 703 | 447 | 613 | 444 | 677 |
| Thermal part of W | X | 40.5042 | 1.11690 | 12.7357 | 29.1684 | 24.4172 | 8.64563 |
| | Y | 89.8375 | 2.97738 | 31.3815 | 64.3791 | 52.2221 | 20.0183 |
| | Z | 116.898 | 3.35453 | 33.2461 | 75.0970 | 61.7836 | 22.2589 |
| Impulse part of W | X | 134.177 | 101.359 | 7.60813 | 95.0728 | 4.66559 | 46.4985 |
| | Y | 187.871 | 160.066 | 11.9983 | 153.266 | 7.29364 | 68.6491 |
| | Z | 255.105 | 178.897 | 12.3074 | 156.020 | 8.83802 | 74.6469 |
| Continual -twist part of W | X | 41 | 11 | 17 | 8 | 22 | 15 |
| | Y | 52 | 10 | 26 | 4 | 35 | 21 |
| | Z | 87 | 35 | 9 | 27 | 4 | 25 |

For Days 2000-050, 2000-083, 2000-149, and 2000-215, the impulse twist is the strongest component among the three twists in the baseline curve. For the remaining days the thermal twist is strongest.

TABLE 27. Imaginary FFT-Derived Maximum Contributions of Baseline Curve Components as a Function of Time

| Maximum abs. value of field over time FT, img | | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
|---|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Baseline (= W) | X | 513 | 523 | 521 | 519 | 541 | 542 |
| | Y | 433 | 506 | 494 | 547 | 641 | 973 |
| | Z | 509 | 703 | 447 | 613 | 444 | 677 |
| Thermal part of W | X | 13.5620 | 1.63082 | 6.72588 | 9.67036 | 19.5088 | 13.7365 |
| | Y | 30.0803 | 4.34736 | 16.5729 | 21.3440 | 41.7242 | 31.8058 |
| | Z | 39.1411 | 4.89805 | 17.5576 | 24.8973 | 49.3637 | 35.3659 |
| Impulse part of W | X | 26.3578 | 46.0706 | 56.8787 | 6.48619 | 28.8283 | 9.58157 |
| | Y | 36.9054 | 72.7545 | 89.7001 | 10.4563 | 45.0668 | 14.1460 |
| | Z | 50.1127 | 81.3138 | 92.0104 | 10.6442 | 54.6094 | 15.3819 |
| Continual -twist part of W | X | 35 | 20 | 28 | 18 | 17 | 30 |
| | Y | 46 | 26 | 46 | 23 | 27 | 45 |
| | Z | 69 | 46 | 4 | 38 | 6 | 34 |

For Days 2000-050, 2000-149, and 2000-215, the continual twist is the strongest component among the three twists in the baseline curve. For the remaining days, the impulse twist is strongest. Hence, the pattern of prevailing twists for the imaginary part of the FFT is different from that of the real part.

The measurements (in nT) of **average** absolute value of magnetic field in the baseline curve and in its component twists appear in Tables 28 and 29. As before, the Table 28 refers to the real part of the FFT, and the Table 29 to the imaginary part.

| TABLE 28. Real FFT-Derived Average Contributions of Baseline Curve Components as a Function of Time | | | | | | | |
|--|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Average abs. value of field over time FT, real | | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| Baseline (= W) | X | 141.543 | 144.394 | 146.038 | 142.480 | 138.339 | 146.486 |
| | Y | 88.2904 | 109.094 | 88.3712 | 97.5812 | 94.5259 | 96.4692 |
| | Z | 82.1530 | 83.2034 | 80.8719 | 93.1343 | 83.1404 | 81.6874 |
| Thermal part of W | X | 14.7929 | 0.43253 | 4.83519 | 10.2427 | 8.40324 | 3.12396 |
| | Y | 26.1720 | 0.88973 | 9.33498 | 20.3090 | 16.8838 | 6.17628 |
| | Z | 32.1490 | 0.99022 | 11.3469 | 24.0054 | 19.7643 | 7.37030 |
| Impulse part of W | X | 0.82956 | 0.27836 | 0.03205 | 0.29147 | 0.02110 | 0.14374 |
| | Y | 1.98022 | 5.84256 | 0.12199 | 5.95815 | 0.11169 | 1.07582 |
| | Z | 2.97535 | 3.80918 | 0.24531 | 1.34991 | 0.12805 | 1.42386 |
| Continual -twist part of W | X | 16.5232 | 4.41548 | 7.51908 | 2.56069 | 9.89056 | 6.25280 |
| | Y | 29.6923 | 5.75684 | 14.9396 | 2.01239 | 20.0676 | 12.0512 |
| | Z | 50.1870 | 19.7345 | 4.90356 | 15.1534 | 2.19402 | 14.0772 |

For Days 2000-050, 2000-083, 2000-116, and 2000-215, the continual twist is the strongest component among the three twists in the baseline curve. For the other two days the thermal twist is strongest. Thus, the impulse twist in field-over-frequency is more prevalent among the maximum field intensities than among the average intensities.

According to the coefficient values, the predominant twist in the baseline curve for Days 2000-050, 2000-083, 2000-149, and 2000-215 is the impulse twist. For the remaining two days, the thermal twist is strongest. These findings are identical to the pattern of prevalent twists for the maximum absolute values of the field in nT.

TABLE 29. Imaginary FFT-Derived Average Contributions of Baseline Curve Components as a Function of Time

| Average abs. value of field over time FT, img | | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
|---|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Baseline (= W) | X | 141.543 | 144.394 | 146.038 | 142.480 | 138.339 | 146.486 |
| | Y | 88.2904 | 109.094 | 88.3712 | 97.5812 | 94.5259 | 96.4692 |
| | Z | 82.1530 | 83.2034 | 80.8719 | 93.1343 | 83.1404 | 81.6874 |
| Thermal part of W | X | 4.95310 | 0.63156 | 2.55352 | 3.39583 | 6.71399 | 4.96347 |
| | Y | 8.76318 | 1.29913 | 4.92991 | 6.73314 | 13.4898 | 9.81311 |
| | Z | 10.7645 | 1.44585 | 5.99245 | 7.95862 | 15.7912 | 11.7102 |
| Impulse part of W | X | 0.16296 | 0.12652 | 0.23959 | 0.01988 | 0.13040 | 0.02962 |
| | Y | 0.38899 | 2.65561 | 0.91197 | 0.40649 | 0.69014 | 0.22168 |
| | Z | 0.58448 | 1.73138 | 1.83393 | 0.09210 | 0.79122 | 0.29340 |
| Continual-twist part of W | X | 14.3320 | 8.39783 | 13.3097 | 7.21435 | 7.75216 | 13.0379 |
| | Y | 26.2784 | 14.6090 | 26.5031 | 13.2828 | 15.6976 | 25.8561 |
| | Z | 39.3607 | 26.2842 | 2.00672 | 21.6497 | 3.38667 | 19.8218 |

For Day 2000-182, the thermal twist is the strongest component among the three twists in the baseline curve. For the remaining days the continual twist is strongest. Hence, the impulse twist in field-over-frequency is more prevalent among the maximum field intensities than among the average intensities, and the pattern of prevailing twists for the imaginary part of the FFT is different from that of the real part.

According to the coefficient values, the predominant twist in the baseline curve for Days 2000-050 and 2000-149 is Angle B of the continual twist. For Days 2000-083, 2000-116, and 2000-182 the impulse twist is strongest. For Day 2000-215, Angle C of the continual twist prevails. These findings are identical to the pattern of prevalent twists for the maximum absolute values of the field in nT.

4.9.1.7 Overall Composition of W According to the Above Least-Squares Method

The above least-squares method does not properly decompose W. Hence, we try to summarize the values above in Sections 4.9.1.2 through 4.9.1.6, in the hopes of discovering a pattern.

Table 30 summarizes the main components of the twists of W according to the angular degrees represented by the coefficients (c_T , c_I , A, B, and C) tabulated above, for each type of plot and each sample day. These components are selected among the following five twist types: Thermal, Impulse, Continual twist angle A, Continual twist angle B, and Continual twist angle C. The last

three are symbolized in the table below as "A," "B," and "C," respectively. The plot types appear in the left-hand column of the table.

The calculations of this table recognize the fact that since the thermal and impulse twists T_5 and I_5 are taken at 5 degrees, their true effect is 5 times their coefficients c_T and c_I .

TABLE 30. Summary of Primary Twist Components by Angle

| Angular degrees | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Time | B | Impulse | Impulse | Thermal | Thermal | Thermal |
| Time FT: real | Impulse | Impulse | Thermal | Impulse | Thermal | Impulse |
| Time FT: imaginary | B | Impulse | Impulse | B | Impulse | C |
| Altitude | B | Impulse | C | B | A | Thermal |
| Latitude | B | Impulse | Impulse | Thermal | Thermal | Thermal |
| Sunlight | Thermal | Thermal | Impulse | Thermal | Thermal | Thermal |

Although the main composition of W depends on the plot type, this dependence is not random. The thermal twist is more prevalent when it is late spring and summer in the Northern Hemisphere than during winter there. The solutions for non-FT time and latitude produce the same results in Table 30.

According to Table 30, the thermal and impulse twists are quite prevalent in the baseline curve, where the thermal twist is a bit more prevalent than the impulse twist. The above results lead one to think that the twists in W consist of Thermal, Impulse, B, C, and A in order of decreasing amounts. However, visual inspection of the graphs shows that the continual and thermal twists are more present in W than is the impulse twist; see Sections 4.9.2.5 and 0.

Table 30 expresses the contribution of each twist to the baseline curve in coefficients and thus in degrees. However, Tables 31 and 32 express it in terms of nT . Table 31 records the dominant twist type with respect to maximum nT over each data day, and Table 32 with respect to average nT . The information in these tables is derived from Sections 4.9.1.3 through 4.9.1.7 above.

| TABLE 31. Summary of Primary Twist Components by Maximum Field Strength | | | | | | |
|--|--------------------|--------------|--------------|--------------|--------------|--------------|
| Maximum nT | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| Time | Impulse, Continual | Impulse | Impulse | Thermal | Thermal | Thermal |
| Time FT: real | Impulse | Impulse | Thermal | Impulse | Thermal | Impulse |
| Time FT: imaginary | Continual | Impulse | Impulse | Continual | Impulse | Continual |
| Altitude | Impulse | Impulse | Continual | Continual | Thermal | Thermal |
| Latitude | Continual | Impulse | Impulse | Thermal | Thermal | Thermal |
| Sunlight | Thermal | Thermal | Impulse | Impulse | Thermal | Thermal |

The results in Table 31 or Maximum nT are identical to those of angular degree, except Time for Day 2000-050, Altitude for Days 2000-050 and 2000-182, and Sunlight for Day 2000-149. The order for Maximum nT is like that for angular degree, except that the thermal twist is a bit less, not more, prevalent than the impulse twist.

| FIGURE 32. Summary of Primary Twist Components by Average Field Strength | | | | | | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Average nT | Day 2000-050 | Day 2000-083 | Day 2000-116 | Day 2000-149 | Day 2000-182 | Day 2000-215 |
| Time | Continual | Thermal | Thermal | Thermal | Thermal | Thermal |
| Time FT: real | Continual | Continual | Continual | Thermal | Thermal | Continual |
| Time FT: imaginary | Continual | Continual | Continual | Continual | Thermal | Continual |
| Altitude | Continual | Thermal | Continual | Continual | Thermal | Thermal |
| Latitude | Continual | Thermal | Thermal | Thermal | Thermal | Thermal |
| Sunlight | Thermal | Thermal | Thermal | Thermal | Thermal | Thermal |

The results in Table 32 for average nT are quite different from those for angular degree and maximum nT. In most cases, the thermal twist is strongest. In the remaining cases, the continual twist prevails. The impulse twist is absent, since it is theoretically zero except for its spikes.

The thermal twist prevails for all sunlight plots, and for all plots of Day 2000-182. The prevalence patterns of the time and latitude rows in the Table 32 are identical for all days. The patterns of the real and imaginary parts of the FT of time are the same except for Day 2000-149.

4.9.2 Inspection of the Graphs

Visual comparison of the baseline plots with the graphs of the twist types shows the conclusions of the analysis in Section 4.9.1 to be misleading, except for the results pertaining to average field strength. In contrast to the analytic method, many FT graphs (see Section 4.9.2.5) bear similarities between the baseline curve and the twists.

This Section is outlined as follows:

Sections 4.9.2.1 through 4.9.2.4 report that the non-FT plots of field versus time reveal a few similarities. For example, the X-axis time plots of the baseline curves resemble the thermal twist. However, these similarities are nowhere as numerous as in the FT graphs, which are treated in Section 4.9.2.5. Sections 4.9.2.6 and 4.9.2.7 relate that many of these similarities and other plot effects are due to noise and natural activity, rather than to the baseline curve and the thermal, impulse, and continual twists.

4.9.2.1 Plots of Field Versus Time

The X-axis curves of the baseline plots (Figure 36) resemble those of the thermal twist (Figure 37). In addition, each baseline plot has spikes that look similar to some of the spikes in its corresponding impulse plot. However, the positions of the spikes of the baseline curve are generally different from those of the impulse curve. In APPENDIX H, Figures 59 (baseline) and 61 (impulse) demonstrate these facts for Day 2000-050.

The field-versus-time plots contain no other discernible effects from which to determine the composition of oscillation types in the baseline curve.

Figures 36, 37, and 38 also appear in APPENDIX H as Figures 59, 60, and 61.

DMSP F15 SSM Data from Julian Day 050
Measured-Minus-Modeled Field versus Time

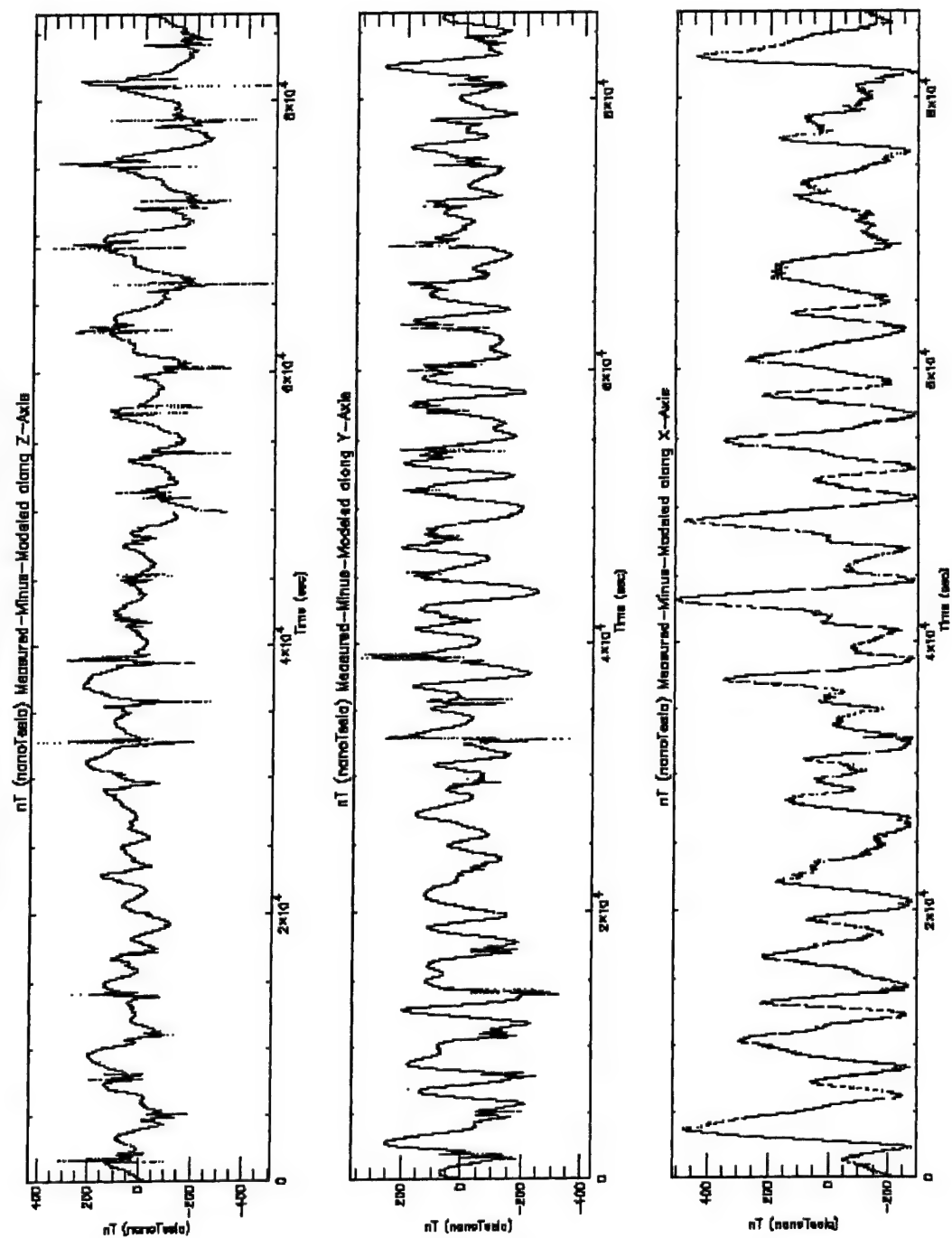


Figure 36. Baseline Curve, Field Versus Time, All 24 Hours of Day 050-2000
(Figure 59 in APPENDIX H).

DMSP F15 SSM Data from Julian Day 050
Measured-Minus-Modeled Field versus Time

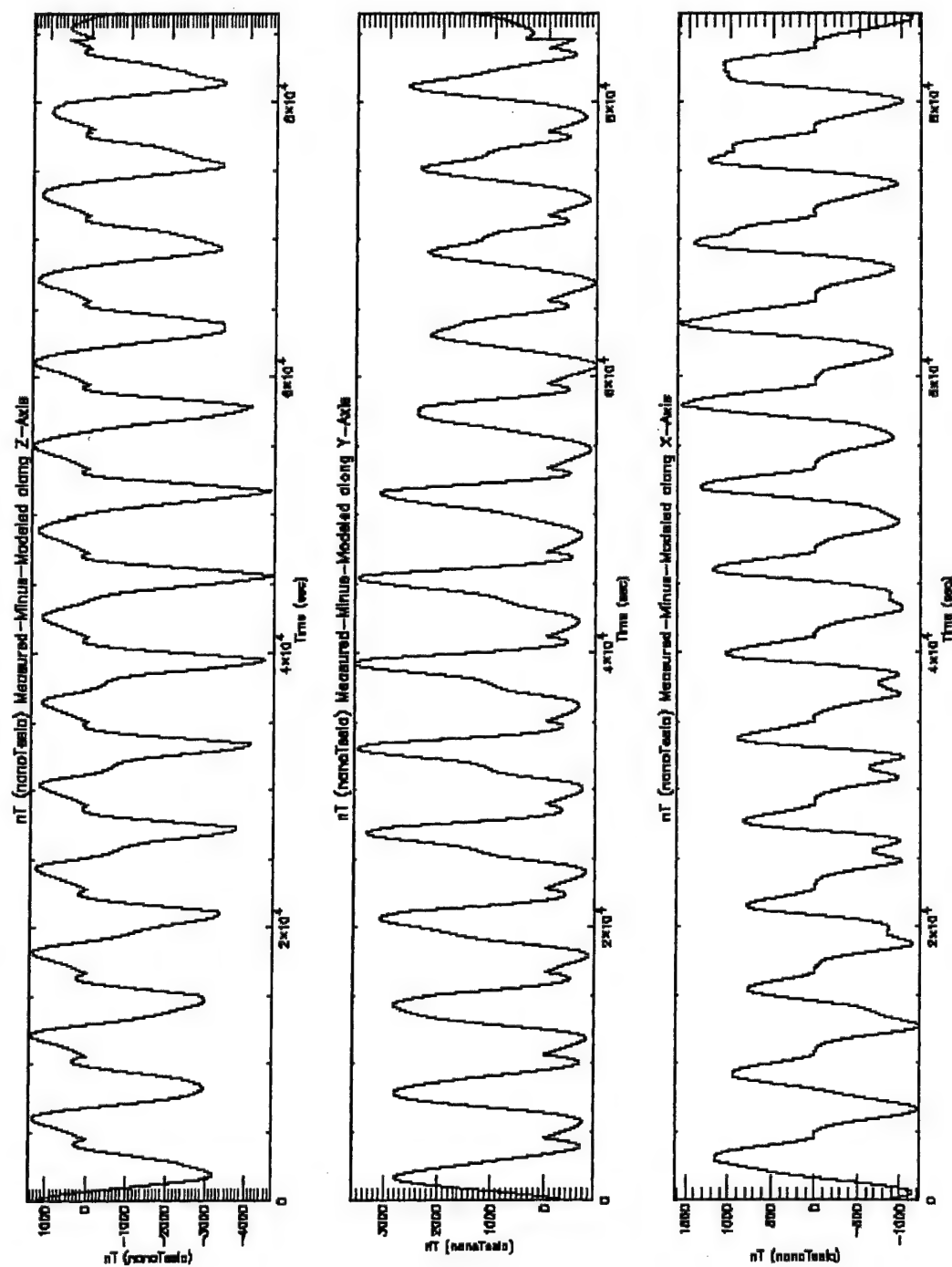


Figure 37. Thermal Twist, Field Versus Time, All 24 Hours of Day 050-2000
(Figure 60 in APPENDIX H).

DMSP F15 SSM Data from Julian Day 050
Measured-Minus-Modeled Field versus Time

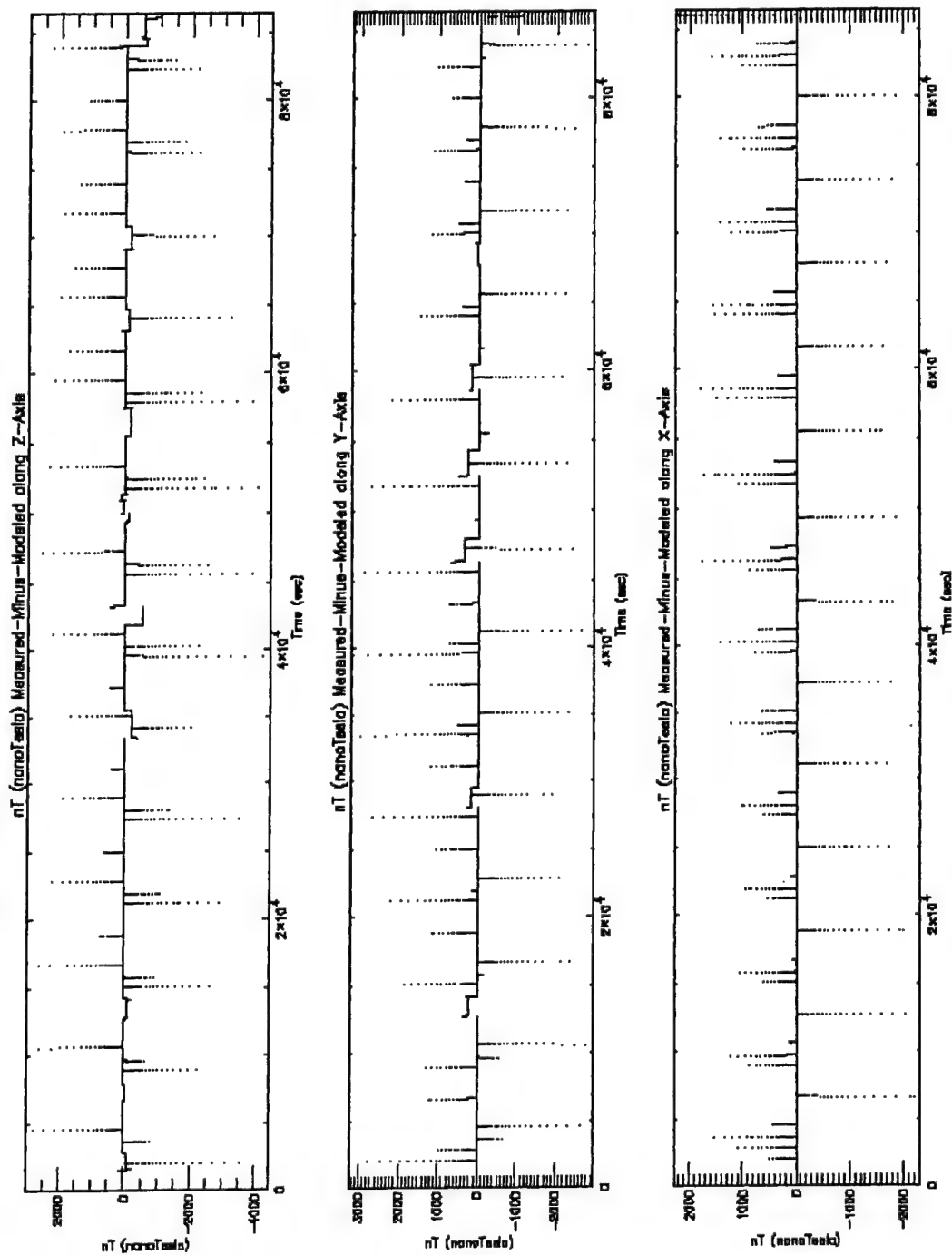


Figure 38. Impulse Twist, Field Versus Time, All 24 Hours of Day 050-2000
(Figure 61 in APPENDIX H).

4.9.2.2 Plots of Field Versus Altitude

The field-versus-altitude plots reveal no similarities between the baseline curve and the twist curves.

4.9.2.3 Plots of Field Versus Latitude

The field-versus-latitude plots reveal no similarities between the baseline curve and the twist curves.

4.9.2.4 Plots of Field Versus Sunlight

In the field-versus-sunlight plots, the only items that show near the terminator crossings, on either end of the plot, are those that are defined in Subroutines APSM_THERMAL and APSM_IMPULSE as the thermal and impulse twists, respectively.

Each thermal-twist plot narrows on the left-hand end, where sunlight = 0, and widens on the right-hand end where sunlight = 1. This finding merely reflects that the thermal twist was defined in Subroutine APSM_THERMAL to be proportional to the amount of sunlight.

Each impulse-twist plot bears a spike at either end, and two spikes straddling the middle of the plot (where sunlight = 0.5). The end spikes correspond to the impulse twists applied in Subroutine APSM_IMPULSE whenever the satellite crosses the day-night terminator. The middle spikes correspond to the equatorial impulses defined in APSM_IMPULSE. In fact, a sample of six latitudes was taken where the sunlight level of the satellite corresponds to a middle spike on the plots. This sample suggests that the satellite crosses the equator when its sunlight level passes through the second middle-spike level on its way from sunlight=0.0 to sunlight=1.0 or vice versa (but in many cases the equator is crossed at the first middle-spike level). For example, when the satellite passes through sunlight=0.65 on its way up from 0.0 to 1.0, its latitude is within 10 degrees of the equator.

The field-versus-sunlight plots reveal no similarities between the baseline curve and the twist curves.

4.9.2.5 Plots of Fourier Transform of Field Versus the Frequency Domains

In contrast to the non-FT plots, many FT graphs bear similarities between the baseline curve and the twists.

For example, in the real and imaginary FT-time curves, the baseline ($F15_{\text{meas}} - F15_{\text{mod}}$) has approximately the same shape as the thermal curves in the X-axis. This similarity is weaker in the Y-axis and the Z-axis. The clusters of data points in the centers of the baseline plots of axes Y and Z are larger than in the X-axis plots. The X-axis clusters are in turn bigger than the clusters on the thermal plots for all three axes.

The FT-time baseline curve, whether real or imaginary, slightly resembles the impulse curve in the X-axis for Day 2000-116 and in the Y-axis for Days 2000-083 and 2000-149.

It is useful to plot the continual twists whose angles are the solutions A, B, and C of each run of the plot programs. These solutions are taken from the previous tables. For example, the continual-twist plot for the imaginary part of FT of time, Day 2000-083, uses the solutions $A = 0.000145$ degrees, $B = -0.058866$ degrees, $C = -0.032724$ degrees in the "Time FT (img coefs)" table.

The time-FFT graphs of the continual twist resemble those of the thermal twist. Thus, in the time-frequency domain, the similarities between the baseline and continual-twist curves are identical to the above resemblances between the baseline and thermal-twist curves.

Each FT-time plot of the baseline and thermal curves contains a small cluster of data points in the middle (where the frequency is close to zero), and a horizontal line stretching across the rest of the page. Hence these plots do not disclose much information. Therefore, another set of plots has been produced, setting the limits of the vertical axis to 10,000 and -10,000. In these plots, the real FT-time curves still exhibit similarities, but not as many as do the uncropped curves. The baseline ($F15_{\text{meas}} - F15_{\text{mod}}$) has approximately the same shape as the thermal curves in the X-axis and Y-axis. The imaginary FT-time baseline and thermal curves are similar in the X-axis for Day 215, but not in all other combinations of axis and day. Otherwise, the resemblance is weak or nonexistent in the X-axis for Day 2000-083, in the Y-axis for Days 2000-116 and 2000-182, and in the Z-axis for all days. For examples using Day 2000-050 for the X-axis, see below in Figure 39 (APPENDIX H, Figure 62 (baseline)) and Figure 40 (APPENDIX H, Figure 63 (thermal)).

DMSP (F15 - F14) SSM Data from Julian Day 050
 Measured-Minus-Modeled Field versus Time-Frequency Variable

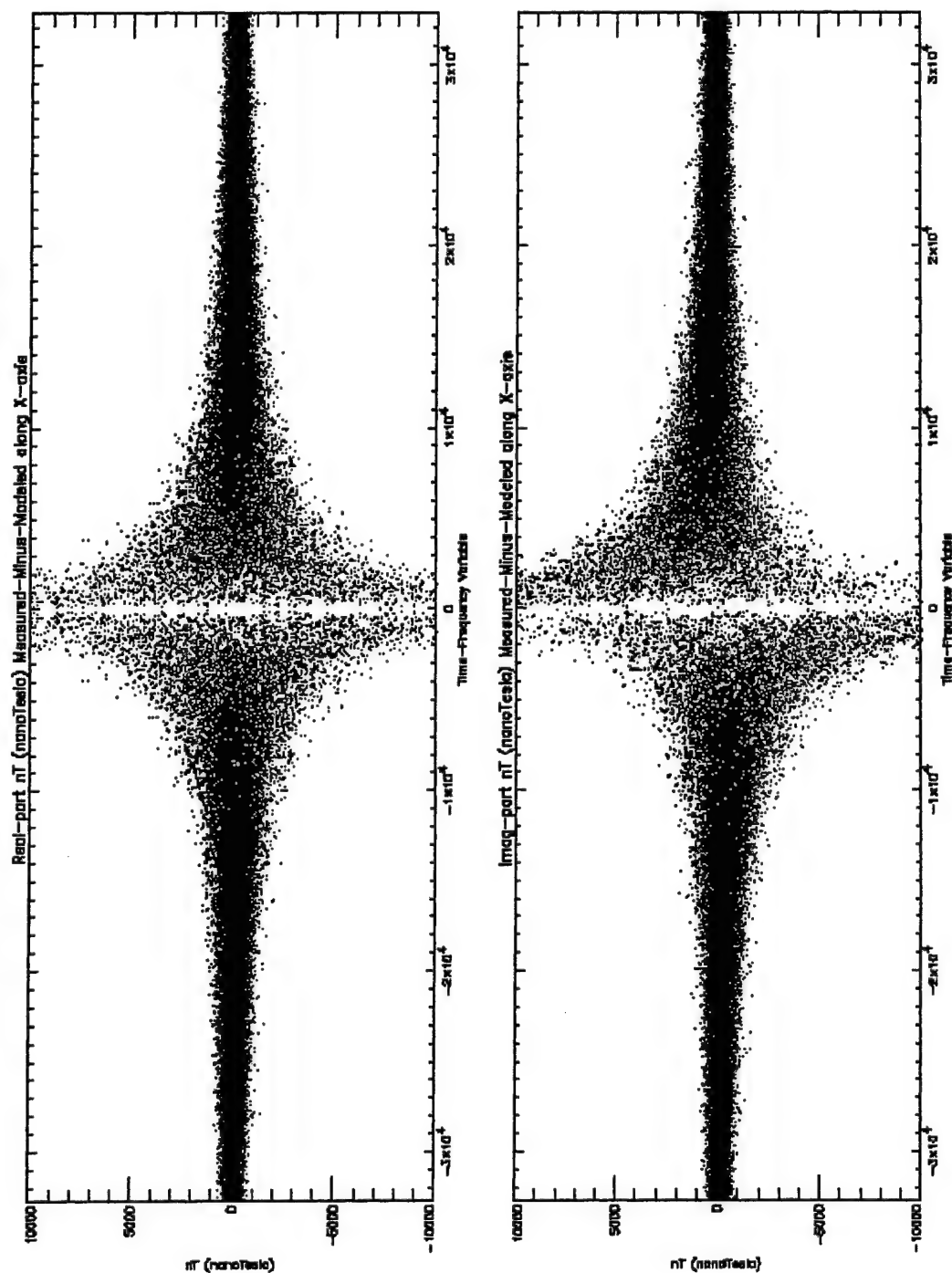


Figure 39. Baseline Curve, FT of Field Versus Time, X-axis, All 24 Hours of Day 050-2000, With Only Field Values Between -10000 and 10000 (Figure 62 in APPENDIX H).

DMSP (F15 - F14) SSM Data from Julian Day 050
 Measured - Minus - Modeled Field versus Time - Frequency Variable

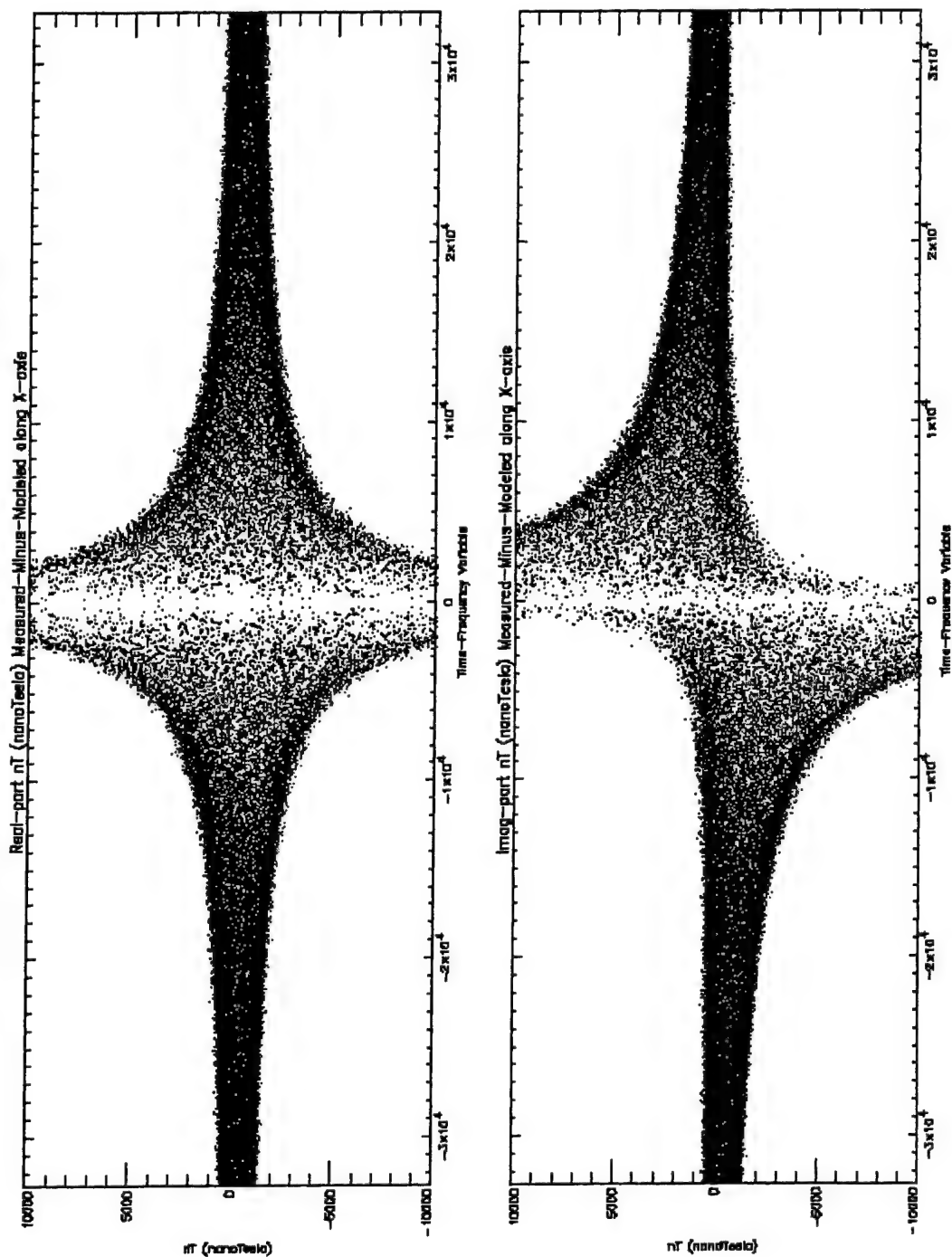


Figure 40. Thermal Twist, FT of Field Versus Time, X-Axis, All 24 Hours of Day 050-2000, With Only Field Values Between -10000 and 10000 (Figure 63 in APPENDIX H).

The baseline curve differs substantially from the impulse curve.

The time-FFT graphs of the continual twist resemble those of the baseline curve, except that the data points are much more scattered in the baseline plots than in the continual twist. In other words, the baseline and continual-twist plots differ mainly by a scale factor. However, in most plots of the imaginary part of the FFT, there is a difference between the baseline and the continual twist in the directions from which the horizontal arms of the plot connect to its center.

In summary, according to visual inspection of the plots, the continual twist is the main component of the baseline curve, with the thermal twist following closely and the impulse twist far behind. This finding contradicts the result of Section 4.9.1 above that indicates that the thermal twist prevails, followed closely by the impulse twist, and the continual twist far behind.

4.9.2.6 Misidentification of Noise

However, not all of the above similarities reflect true boom twists. Many of these similarities are due instead to noise or natural phenomena. Section 4.9.2.6 deals with noise, where Section 4.9.2.7 addresses natural phenomena.

Given a twist type:

Thermal, Impulse, or Continual

a domain over which the field is plotted:

time, altitude, latitude, sunlight, real part of time FFT, or imaginary part of time FFT
and the recorded quantity of field strength in nT:

maximum absolute value, or average absolute value

the amount of noise in such a combination depends on several factors, of which we consider three. The most important is the magnitude (in nT) of this field relative to the magnitude of the baseline field. The second factor measures the consistency of the magnitude over the three axes (whether or not for each sample day, field strength increases as one goes up the axes from X to Y and then Z). The least important factor is the consistency of the magnitude over the sample days (whether or not field strength is highest on Days 2000-149 and 2000-182 or follows an obvious pattern).

For example, if one has solved for a thermal artifact, but the magnitude of the artifact is very small, then one may have only found a partial fit to some of the noise. If it is large, then it is more likely to be "real." If the artifact tends to gain strength as one goes up the axes, then it is more likely to be real. However, if the size of the artifact varies wildly, then one may have just solved for a lot of different noises on different days.

The following classifies the amount of noise for all combinations of twist type, domain, and recorded quantity. Each such combination is rated Low noise, Medium noise, or High noise. This rating is based on the above three factors (size relative to baseline, monotonicity over the axes, and consistent pattern of strongest days) in decreasing order of importance. "Real" represents the real part of FFT time, and "imaginary" stands for its imaginary part. Each line represents one or more combinations and uses the following format:

twist type - domain(s) - maximum, average, or both

Low noise

Thermal - time, latitude, and sunlight - both maximum and average

Thermal - real - average

Impulse - latitude and real - maximum

Continual - time, latitude, and imaginary - average

Medium noise

Thermal - altitude and imaginary - both maximum and average

Thermal - real - maximum

Impulse - time, altitude, sunlight, and imaginary - maximum

Continual - all domains - maximum

Continual - altitude, sunlight, and real - average

High noise

Impulse - all domains - average

The average field strength correlates well to the plots. Thus, it more reliably indicates baseline decomposition than does the maximum strength, which corresponds to the least-squares solution coefficients of angular degree. The entries above that correspond to the average field strength are isolated below. Again, "real" represents the real part of FFT time, and "imaginary" stands for its imaginary part. Each row has the notation:

twist type - domain(s)

Low noise

Thermal - time, latitude, sunlight, and real

Continual - time, latitude, and imaginary

Medium noise

Thermal - altitude and imaginary

Continual - altitude, sunlight, and real

High noise

Impulse - all domains

Thus, we conclude that the thermal-twist component of the baseline curve contains slightly less noise than does the continual-twist part. The impulse-twist component is far behind and contains much noise.

4.9.2.7 Misidentification of Natural Phenomena

The recorded twist components of the baseline curve may stem not only from noise, but also from natural phenomena, especially in auroral latitudes. Two major types of such phenomena are discussed here:

--Actual long-period curves in the measured-minus-modeled field due to activity, storms, equatorial magnetism, ephemeris error, and most of all error in the model-field curve. Artifacts that are found should exceed the level of error involved. Consistency is also important: if there is a long-period (e.g., most of an orbit) effect from the boom, then this effect should appear in the data for multiple days. Otherwise, these effects are probably due to natural activity.

-- Auroral regions: if the correspondence of impulse artifacts to the data at the terminators is improved when the terminator coincides with the area of auroral activity, then that improved correspondence is likely due to misidentifying natural spikes representative of aurora activity as impulse artifacts caused by the terminator.

Section 0 below discusses the various artifacts that regularly occur in the plots, and mentions whether each artifact is likely to be part of the baseline curve or the twists, as opposed to natural activity. Section 0 focuses on spikes in the impulse twist that appear in auroral regions. Section 0 summarizes Section 0 by suggesting that all artifacts except for altitude-plot spots and kinks are natural phenomena.

4.9.2.7.1 Artifacts

Each field-versus-altitude plot of the baseline curve contains dark spots at around 850 km and at the highest altitude for this plot. For Day 2000-116 the first dark spot occurs near 862 km instead of 850 km, and a change of shading takes place near 851 km. For Day 2000-149, the first dark spot is near 860 km and the shading change near 852 km. Hence, this effect is fairly consistent across the data days, and is probably due to the twist components of the baseline.

In addition, the field-versus-altitude plot of the continual twist for Day 2000-083 contains vertical blotches of data points near 850 and 852 km. The plot for Day 2000-116 shows a large vertical line at around 867 km. For Day 2000-149 this line appears at 869 km. For Day 2000-215 the line occurs near 852 km. These lines are less noticeable on the X-axis. This set of plots also contains less prominent vertical lines not listed above. In summary, the lines are somewhat consistent over the data days, but small and anomalous enough to be regarded as natural activity.

The altitude plots of the thermal twist for all days except Day 2000-116 contain kinks in the vicinity of 850 km. Hence, the kinks are consistent, and thus, probably part of the thermal twist itself.

The field-versus-latitude plots of the baseline curve contain spots of active data near the left-hand and right-hand ends of the plots. Although these spots are consistent, their positions represent high latitudes, the auroral regions. Hence, they may be due to auroras.

The latitude plots of thermal twist for all days contain at least one long straight line that resembles a bowstring. This line appears isolated from the rest of the plotted data points, with its right-hand end at 80 degrees North. Its left-hand end varies from 10 to 40 degrees South depending on the individual day. Days 2000-050 and 2000-083 have bowstrings in the Y-axis and Z-axis plots. Days 2000-116, 2000-149, and 2000-215 contain bowstrings only on the Y-

axis. For Day 2000-182 the bowstring appears only on the Z-axis. Although the bowstring is fairly consistent, it seems anomalous and thereby due to a natural effect.

Each field-versus-sunlight plot of the baseline curve contains spots of active data near 0.2 and 0.9 on the horizontal axis. Although these spots are consistent, their positions represent regions near where they cross the day-night terminator. These crossings take place at high latitudes. Hence, the active spots may be due to auroras.

A natural consequence of the Fourier Transform plots is that most of the field strength is confined to frequencies near zero. In addition, the close-up FT plots of the baseline curve and the continual twist, where the vertical axis is chopped to $[-10000, 10000]$, show a vertical gap for frequencies very close to zero. This gap may stem from construction of the FT algorithm. In summary, the effects seen on the FT plots come from the FT algorithm, not from the boom twists themselves.

4.9.2.7.2 Impulse Spikes in Auroral Regions

The impulse twist lies in the auroral zone. A small sample has been taken of the most prominent impulse spikes in the baseline curves of field versus time. The vast majority of spikes in this sample occur in high latitudes. This observation suggests that the spikes are due to auroras, not to impulse twists of the F15 boom.

In addition, the plots have been re-drawn with the impulse at a random location (at 45 degrees north) instead of at the equator and day-night terminator. The fit between the baseline and impulse plots is not better with the impulses in their original locations than when the impulse is applied at 45 degrees north. This finding is another indication that the impulse twist is due to a natural phenomenon.

4.9.2.7.3 Which Artifacts are Actual Twists?

Of all artifacts listed above, the only ones likely to stem from the data itself, rather than from natural activity, are dark spots and thermal kinks on the altitude plots.

4.9.3 Summary of Decomposition Analysis

This Section combines the most important results of Sections 4.9.1 and 4.9.2. Section 4.9.3.1 demonstrates the lack of important findings of the least-squares method of Section 4.9.1, whereas Section 4.9.3.2 concentrates on the more successful comparison of plots in Section 4.9.2.

4.9.3.1 Least-Squares Results

This Section portrays the ineffectiveness of the least-squares method. Section 4.9.3.1.1 explains why little of the baseline curve is decomposed, and suggests a remedy to this problem. Section 4.9.3.1.2 summarizes the overall composition of the baseline curves as found above in Section 4.9.1.7, and records a test that decides whether the spikes found in the curves are from real impulses.

4.9.3.1.1 Decomposition of a Small Amount of the Baseline Curve

The analytical results do not accurately decompose the baseline curves because their least-squares method adds the errors for every point, so that a single point with a large residual error is enough to make the error large, ruining the accuracy. In other words, even if two curves look alike when graphed, many of their points are different, enough to bring $|R|_2$ close to $|W|_2$. In addition, the least-squares method used in the analysis may contain errors, especially in its approximation of the continual twist. Noise may be another source of error. Thus, the analytical results do not detect the similarities found on the graphs.

4.9.3.1.2 Overall Makeup of the Baseline Curve

The results of Section 4.9.1.7 lead one to think that the twists in W consist of Thermal, Impulse, B, C, and A in order of decreasing amounts. However, visual inspection of the graphs shows that the continual twist; which consists of A, B, and C; and the thermal twist prevail over the impulse twist; see Sections 4.9.2.5 and 4.9.3.2.1. The impulse twist is the least present of the three twist types in the baseline curve, since it is theoretically zero except for spikes over selected small intervals of time.

That the impulse twist seems to be a dominant component according to Section 4.9.1.7 is no surprise. It is easier to fit a function consisting of various "random" curves with a series of impulse functions. This is even truer when there are impulse-like spikes in the high latitudes. In fact, a small sample has been taken of the most prominent spikes in the baseline curves of field versus time. The vast majority of spikes in this sample occur in high latitudes. This observation suggests that the spikes are due to auroras, not to impulse twists of the F15 boom.

As a control to the impulse experiment, the plots have been re-drawn with the impulse at a random location (at 45 degrees north) instead of at the equator and day-night terminator. The fit between the baseline and impulse plots is not better with the impulses in their original locations than when the impulse is applied at 45 degrees north. This finding is another indication that the baseline curve does not have a strong impulse-twist component.

The proportions of contributions of the three twists to the baseline curve in terms of Maximum nT are identical to those of angular degree, except Time for Day 2000-050, Altitude for Days 2000-050 and 2000-182, and Sunlight for Day 2000-149. The order of prevalence of these contributions for Maximum nT is like those for angular degree, except that in the former, the thermal twist is a bit less, not more, prevalent than the impulse twist.

The proportions of contributions in terms of Average nT are quite different from those for angular degree and Maximum nT . In most cases, the thermal twist is strongest. In the remaining cases, the continual twist prevails. The impulse twist is absent, since it is theoretically zero except for its spikes.

4.9.3.2 Visual Inspection

This Section summarizes the many conclusions drawn from visually comparing the baseline plots with those of the twist types, especially for the Fourier transforms.

4.9.3.2.1 Results

Among the non-FT baseline curves, the X-axis curves of field versus time resemble those of the thermal twist. Each field-versus-time plot has spikes that look similar to some of the spikes in its corresponding impulse plot. However, the impulse plot has different spike positions from those of the baseline plot.

The remaining non-FT baseline curves do not resemble the plots of their corresponding twist types.

However, the FT graphs reveal more information than do the non-FT graphs and the analytical results. Two groups of GIF images have been used to determine the decomposition of the baseline curve. In one group, the extremes of the vertical axis are set to [TMIN, TMAX]. Here TMIN is the minimum field in nT in a given plot of field versus domain, and TMAX is the maximum field. In the other group, the vertical axis is limited to the interval [-10000, 10000], thereby magnifying the plot origin (frequency = 0, field = 0) and its vicinity where most of the data points are concentrated.

Of the three axes, the X-axis and Y-axis contain the greatest amount of similarity between the baseline curve and the three twists. The Z-axis has the fewest similarities.

Overall, the most similar twist to the baseline is the continual thermal twist, followed closely by the thermal continual twist, leading to the conclusion that the boom effect is mostly due to continual and thermal oscillation. This finding sharply contradicts the conclusion found by the least-squares method, which claims that the impulse twist is the best fit (see end of Section 4.9.1.7).

4.9.3.2.2 Confusion of Boom Twists with Noise and Natural Sources

However, many of the above similarities come from noise and natural phenomena.

Measurement of the noise is based on several factors. The primary factor is the field intensity of each twist component of the baseline curve relative to that of the baseline itself. The second is whether or not for all sample days the twist magnitude increases from the X-axis to the Y-axis and then the Z-axis. The least important is consistency in pattern of magnitude change over the sample days.

In general, the thermal-twist component of the baseline curve contains slightly less noise than does the continual-twist part. The impulse-twist component is far behind and consists of much noise.

As with noise, attribution of artifacts in the baseline and twist curves to natural phenomena is based on magnitude of these effects and their consistency over the data days. Several types of artifacts found in the output plots, that are consistent over the sample data days, are treated below. Some of them may be part of the twist itself, whereas others are probably due to natural activity.

The field-versus-altitude plots of the baseline curve and non-impulse twists contain dark spots, changes in shading, kinks, and vertical lines. Most of them can be found between 850 and 852 km. or at the highest altitude on the plot. The vertical lines appear to be added natural phenomena, whereas the other effects may come from the twists themselves.

The field-versus-latitude and field-versus-sunlight plots of the baseline curve contain spots of active data near both ends of the plot. These ends reflect high latitudes, and thus auroral regions. Hence, they may be due to auroras. Similarly, a small sample of impulse spikes shows that the spikes in the impulse twist are due to auroras.

On the FT plots, the artifacts are probably due to mathematical properties of the FT algorithm, not to the twists themselves.

To conclude, the only artifacts likely to stem from the data itself are dark spots and thermal-twist kinks on the altitude plots.

4.10 Summary Of Boom-Artifact Experiment

This Section draws conclusions from all of the results in the entire boom-effect experiment reported in this paper. These results appear in Sections 4.6.3 and 4.8.3.

Sections 4.10.1 and 4.10.2 attempt to answer the questions posed at the beginning of this paper. Section 4.10.1 refers to Sections 4.6.3 that indicates whether or not the results of *Cook, et al.* [1997] hold for the real data sets.

Section 4.10.2 summarizes what factors, if present, would exert the greatest influence on the output measured-minus-modeled amounts of magnetic-field intensity. Afterwards, Section 4.10.3 lists observations from the factor-comparison study of Section 4.8 that are not covered in Section 4.10.2. Sections 4.10.2 and 5.10.3 refer to Section 4.8.3.

Section 4.10.4 summarizes the most important results of the baseline-curve decomposition in Section 4.9, as well as the attribution of most curve artifacts to noise and natural phenomena.

Section 4.10.5 is a short epilogue that addresses the challenge of removing errors from the field measurements.

4.10.1 The Results of the Preliminary Simulation

One objective of Section 4.6 is to confirm the results of *Cook, et al.* [1997] for a different set of data from that used in *Cook, et al.* [1997]. It turns out that, as stated in Section 4.6.3, the study of Section 4.10.2 confirms most results of *Cook, et al.* [1997]. However, unlike in *Cook, et al.* [1997], the baseline plots (of unmodified measured-minus-modeled data) for many sample days

of data contain oscillations. In addition, stronger oscillations in the X-axis exist on all baseline plots than those seen in *Cook, et al.* [1997]. Both changes may be due to the fact that the prefiles of Section 4.6.3 represent different days and satellite numbers from those in *Cook, et al.* [1997].

4.10.2 Order of Importance of Twist Types and Other Factors

This and the following Section refer to Section 4.8.3.

The question is what factors, if present, would exert the greatest influence on the output measured-minus-modeled amounts of magnetic-field intensity. The answer is that the most influential factor is the heat angle, since it greatly influences curves X, Y, and Z. Next come the continual-twist angles, since each such angle affects two of these three curves. Of these angles, B is first since it drives somewhat more data points out of the plotting bounds than does C. In turn, C causes much more out-of-bounds data than does A.

The next factor in the order is the day number. Like the above factors, the day number influences oscillations that affected the whole curve, but these oscillations are weaker than the above twist-angle effects.

The impulse parameters do not affect the curve as a whole, but cause spikes to grow out of the baseline curve. Among these factors, the impulse angle is first since multiplying it by N multiplies the spike heights also by N. The damping angle is next, for it influences the spike heights, but not to the degree of multiplication by N. The impulse duration merely reduces the number of spikes when the impulses last a very long time.

The Universal time is ranked last since it does not at all affect the curves in these experiments with induced artifacts.

From the above order of factors, it can be advised that the top priority is to remove the effects of thermal and continual boom oscillation from the data, whereas damped-impulse oscillation is not such a problem. Section 4.9.2.5 demonstrates that for six months of real data, the "detectable" boom oscillation is indeed mostly classified as thermal and continual.

4.10.3 Other Observations

Other facts can be culled from results in Section 4.8.3.

The most noticeable effect is that the X-axis field differences tend to be smaller than those of the Y-axis and Z-axis. In addition, many effects in the Z-axis such as spikes and thermal oscillations are mirrored in the Y-axis. Thus, boom oscillations tend to disturb the directions Y and Z of the magnetic field equally, and more strongly than they disturb the X-direction.

Moreover, the twist types are additive and multiplicative, and thus linear, so that the effects on the magnetic-field differences are proportional to the angle by which the boom is twisted. Thus, we can search for, and potentially remove, each twist type separately without knowing its magnitude in advance.

The twist types are additive, since combining two or more twist types adds their effects on the plot, following the rules of constructive and destructive interference of waves, an effect that is most interesting because of its implications for detection and removal. However, this effect of adding the twist types is noticeable only when the waves interfere constructively. Moreover, when all three twist types are combined, the impulse twist is the most conspicuous of the three types because of its distinct form; the continual and thermal twists are hard to tell apart.

The twist types are multiplicative in the following manner. Multiplying a continual-twist angle (A, B, or C) by N does not influence its corresponding curve, but multiplies the amplitude of each of the other two curves by a factor equal to, or approximately, N. For example, multiplying A by N leaves the X-curve alone, but multiplies the amplitudes of Y and Z by N.

On the other hand, multiplying the maximum heat angle or the maximum impulse angle by N multiplies the amplitudes of X, Y, and Z by N. This fact followed since each of these two twist algorithms rotates the measured-field vector by the same angle in all three dimensions.

However, the factors other than the maximum twist angles have less than a linear effect on the field differences. Multiplying the damping time by N raises the impulse height, but by a factor less than N. Moreover, the impulse height actually *decreases* with damping time as the latter quantity grows near 1200 seconds. As the damping time increases, the spikes thicken and split apart at the bottom. Increasing the time of application of impulses does little except to reduce the number of spikes when the impulses last a very long time.

4.10.4 Decomposing the Baseline into Twist Types

This Section refers to the tables of Section 4.9.1.7 and the plot comparisons of Sections 4.9.2.1 and 4.9.2.5.

The baseline curve has been decomposed using two methods: least-squares solution and visual inspection of plots. The former method decomposes only a small part of the baseline. Its results indicate that the thermal and impulse twist types have the greatest rotation angles and maximum field strengths, whereas the thermal and continual twists have the largest average field strengths. However, only the results for average field strength are compatible with the plot inspection, which shows that the baseline curve is most similar to the thermal and continual twists.

The pattern of prevalence of twist types for the maximum absolute value of field is nearly identical to that of the rotation angle. In particular, the thermal twist has the largest contribution of rotation angle in the baseline curve, with the impulse twist close behind. On the other hand, the impulse twist has the largest maximum absolute value of nT because of its spikes, followed

closely by the thermal twist. The continual twist is far behind in both rotation angle and maximum absolute value.

A reason for this correlation is that the angle parameter for the thermal and impulse twists determines the maximum rotation of the boom and thus the maximum absolute value of field. This relationship is not true for the continual twist, which anyway plays only a smaller role than do the other twists.

The prevalence pattern of twist types for the average absolute value is similar to that of the plots that graph Fourier transform of field versus frequency. For the average absolute value, the thermal twist is strongest, followed closely by the continual twist. For the plots, the continual twist is slightly ahead of the thermal twist. For both average absolute value and plots, the impulse twist lags far behind, since most of its field strength occurs in the spikes, which involve only a small fraction of the data points.

Among the non-FT plots, the only similarities between the baseline curve and the twist types appear in the field-versus-time plots. In the field-versus-time X-axis plots, the baseline curves resemble the thermal twists. For all axes, the field-versus-time baseline curves have spikes that look similar to a few spikes in the impulse plots.

4.10.4.1 Confusion of Boom Twists with Noise and Natural Sources

However, many of the above similarities come from noise and natural phenomena.

The thermal-twist component of the baseline curve contains slightly less noise than does the continual-twist part. The impulse-twist component is far behind and consists of much noise.

As with noise, attribution of artifacts in the baseline and twist curves to natural phenomena is based on magnitude of these effects and their consistency over the data days.

Several types of artifacts, which are consistent over the sample data days, appear in the output plots. Of all artifacts listed above in Section 0 and 0, the only ones shown to stem from the data itself, rather than from natural activity, are dark spots and kinks on the field-versus-altitude plots. A dark spot is an intensely shaded (black) area, and a kink is a sharp bend in a curve. Such kinks may be due to a thermal twist in the boom.

The artifacts on the FT plots are due to properties of the FT algorithm. The remaining artifacts appear anomalous or lie in auroral latitudes.

4.10.5 Epilogue

The model presented in this report is but a simple implementation of the system. The varieties of errors present different challenges to the filtering process, and in combination may conflict with the removal of each other. Nevertheless, if the precision of the data allowed it, the errors

discussed must be removed from the SSM data in order for it to be more accurate for better use in forecasting or analytical models.

5. SUMMARY

This section provides a brief summary of the salient observations of this data study. For more detailed discussions of results, see individual sections.

1. An early calibration for the SSM aboard DMSP F15 was determined. It is recommended for use from launch through day 2000-097. The calibration is:

$$\begin{aligned} [Bx'] &= [0.99528597 \quad 0.00917236 \quad 0.00593256] [Bx] + [-20.65] \\ [By'] &= [-0.00033594 \quad 0.99729121 \quad -0.00337577] [By] + [-13.17] \\ [Bz'] &= [0.00108272 \quad -0.00326025 \quad 0.99352186] [Bz] + [-1.77] \end{aligned} \quad (46)$$

2. A late calibration for the SSM aboard DMSP F15 was determined. It is recommended for use from day 2000-098 until superceded. The calibration is:

$$\begin{aligned} [Bx'] &= [0.99517418 \quad 0.00863488 \quad 0.00699771] [Bx] + [-16.65] \\ [By'] &= [-0.00055869 \quad 0.99756404 \quad -0.00291095] [By] + [-10.14] \\ [Bz'] &= [0.00022768 \quad -0.00329771 \quad 0.99405258] [Bz] + [-0.68] \end{aligned} \quad (47)$$

3. When defined as the range of differences between two calibrations on two different adjacent days' data, the accuracy of the calibration process is about +/-8, +/-12, -7 to 1, 3 to 14nT, in X, Y, Z, and magnitude, respectively.
4. When defined as the difference between the calibrated measured and modeled fields, the average precision of the calibration is about 25, 44, 25, 64nT, in X, Y, Z, and magnitude, respectively. If the difference is expressed as one sinusoidal error in each dimension, the amplitudes of the sinusoids are in the range of 33-47, 60-82, 22-82, and 82-140nT in X, Y, Z, and magnitude, respectively.
5. The calibrated measured-minus-modeled field data contains one to three orbital-period sinusoids in each axis, independent of magnetic activity and exclusive of unusual phenomena. While they vary in amplitude versus each other for a given data set, most are contained in the following ranges:
 - 80 to 130 nT for the X-axis
 - 80 to 150 nT for the Y-axis
 - 80 to 80 nT for the Z-axis
6. Various error sources such as a satellite altitude or other ephemeris error, or a time-phase error between position (model) and data frame (measurement) could account for errors of the magnitude and type observed, but the error has not been conclusively attributed to any one

source. The form of the calibration is incapable of removing non-linear and date/time dependent errors.

7. In the Z-axis of the measured-minus-modeled field, a sinusoid occasionally displays much greater amplitudes for a given day of data than is typical for that dimension. This Z-wave was observed primarily early in the year 2000, and can exhibit amplitudes of up 300nT.
8. A sawtooth wave was observed in the X-dimension on all days. The typical height of the vertical discontinuity was 20-30nT, with a period of 70-100seconds.
9. The effects of potential boom-induced errors are additive and multiplicative, so that the effects on the magnetic-field differences are proportional to the angle by which the boom is twisted. Thus, each twist type can be searched for, and potentially removed, separately without knowing its magnitude in advance.
10. No gross boom-induced artifacts were observed except for the Z-wave, X-sawtooth, and the remaining sinusoids in the data. It is not impossible to confirm or deny the presence of artifacts having an effect smaller than the level of precision of the calibrated data.

REFERENCES

- Agrawal, D., VBnet Sort FAQ: Understanding the QuickSort Routine at the Website
<http://www.mvps.org/vbnet/faq/quicksortdef.htm>, retrieved 5 June 1997.
- Cook, Colin U., N.I. Miller, and L. E. Sexton, F14 SSM Data: Artifact Detection and Removal,
Written by Colin U. Cook, of Radex, Inc. for AFRL-VSE, 12 September 1997.
- Cook, Colin U., N.I. Miller, and L. E. Sexton, *A Simulation of DMSP F15 SSM Data: Boom
Oscillations*, 12 September 1997.
- Cook, Colin U. and L. E. Sexton, *Draft copy of APHB Version 4 Defense Meteorological
Satellite Program Special Sensor Magnetometer Data Processing Software (SSM
Telemetry to Parameters Converter), Volume 7 Software User's Manual, Section 7.11.*
- NOAA download from website
ftp://www.ngdc.noaa.gov/Solid_Earth/Mainfld_Mag/Models/igrf2000.dat, IGRF
spherical harmonic coefficients of the internal magnetic field of the earth, on 27
December 1999.
- NOAA download from website www.ngdc.noaa.gov/stp/GEOMAG/kp_ap.html on 10 January
2001.
- Olsen, N., R. Holme, G. Hulot, T. Sabaka, T. Neubert, L. Tøffner-Clausen, F. Primdahl, J.
Jørgensen, J.-M. Leger, D. Barraclough, J. Bloxham, J. Cain, C. Constable, V. Golovkov,
A. Jackson, P. Kotze, B. Langlais, S. Macmillan, M. Manda, J. Merayo, L. Newitt, M.
Purucker, T. Risbo, M. Stampe, A. Thomson, C. Voorhies, Ørsted initial field model,
Geophysical Research Letters, 27, No. 22, 3607-3610, November 15, 2000 .
- Press, W. H., B. P. Flannery, S. A. Teukolsky, and W. T. Vetterling, *Numerical Recipes: The Art
of Scientific Computing*, Cambridge University Press, Cambridge, 1986.
- Proakis, J. G. and M. Salehi, *Communication Systems Engineering*, Prentice Hall, Englewood
Cliffs, NJ, 15 January 1994.
- Sexton, L. E., *Summary of Efforts Relating to Calibration of the Special Sensor Magnetometer
Aboard DMSP F15*, 1 March 2000.

APPENDIX A. EARLY CALIBRATION DATA QUALITY RESULTS

The columns of data below have the following format from left to right:

1. Day of year 2000.
2. Day average difference from zero of measured-minus-modeled field for all X (down) components in nT.
3. Day average difference from zero of measured-minus-modeled field for all Y (velocity) components in nT.
4. Day average difference from zero of measured-minus-modeled field for all Z (orbit normal) components in nT.
5. Day average magnitude of differences from zero of measured-minus-modeled field for all components in nT.
6. Day average difference from zero of measured-minus-modeled field for non-auroral (automated clipping) X (down) components in nT.
7. Day average difference from zero of measured-minus-modeled field for non-auroral (automated clipping) Y (velocity) components in nT.
8. Day average difference from zero of measured-minus-modeled field for non-auroral (automated clipping) Z (orbit normal) components in nT.
9. Day average magnitude of differences from zero of measured-minus-modeled field for non-auroral (automated clipping) components in nT.
10. Angle between a field vector of [18000 18000 18000]nT and that same vector with the correction ORTHO calibration matrix applied, in degrees. Correction ORTHO matrix is the result of applying the early calibration to that day's data and then calculating an ORTHO and OFFSET for that day's non-auroral (automated clipping) calibrated data. It is a measure of the difference between the early calibration and a calibration based on just that day's data.
11. Angle between a field vector of [18000 18000 18000]nT and that same vector with the correction ORTHO and OFFSET calibration matrices applied, in degrees. Correction matrices are the result of applying the early calibration to that day's non-auroral (automated clipping) data and then calculating an ORTHO and OFFSET for that day's calibrated data. It is a measure of the difference between the early calibration and a calibration based on just that day's data.
12. Difference in magnitude between a field vector of [18000 18000 18000]nT and that same vector with the correction ORTHO and OFFSET calibration matrices applied, in nT. Correction matrices are the result of applying the early calibration to that day's non-auroral (automated clipping) data and then calculating an ORTHO and OFFSET for that day's calibrated data. It is a measure of the difference between the early calibration and a calibration based on just that day's data.
13. Daily Ap.

| | | | | | | | | | | | | |
|-----|-------|-------|--------|--------|-------|-------|--------|--------|--------|--------|-------|----|
| 005 | 36.83 | 63.96 | 175.78 | 205.43 | 24.42 | 57.00 | 184.24 | 204.36 | 0.1414 | 0.1633 | 96.83 | 19 |
| 006 | 33.86 | 54.87 | 41.26 | 88.74 | 22.98 | 45.79 | 25.58 | 65.19 | 0.0885 | 0.0943 | 18.76 | 19 |
| 007 | 32.34 | 48.73 | 29.62 | 75.68 | 21.70 | 42.77 | 20.69 | 58.52 | 0.0527 | 0.0645 | 20.82 | 10 |
| 008 | 32.09 | 51.16 | 156.48 | 179.33 | 22.58 | 45.74 | 168.91 | 184.43 | 0.1789 | 0.2169 | 86.18 | 5 |
| 009 | 34.14 | 45.94 | 60.70 | 93.08 | 26.34 | 41.92 | 62.47 | 87.34 | 0.0153 | 0.0331 | 6.51 | 3 |
| 010 | 33.03 | 56.06 | 151.01 | 176.07 | 25.12 | 47.87 | 162.00 | 178.11 | 0.0760 | 0.0995 | 16.48 | 6 |
| 011 | 34.79 | 67.00 | 49.86 | 106.40 | 26.00 | 54.00 | 28.90 | 76.91 | 0.0844 | 0.0932 | 34.52 | 24 |
| 012 | 40.42 | 58.71 | 57.53 | 105.37 | 30.18 | 52.80 | 49.62 | 89.04 | 0.0529 | 0.0421 | 6.32 | 10 |
| 013 | 36.84 | 53.34 | 30.53 | 82.47 | 27.69 | 46.46 | 20.09 | 64.79 | 0.0763 | 0.0895 | 15.88 | 9 |
| 014 | 31.06 | 50.27 | 63.97 | 98.51 | 20.80 | 42.96 | 64.85 | 88.27 | 0.0386 | 0.0418 | 36.17 | 8 |
| 015 | 30.19 | 48.89 | 74.84 | 104.79 | 20.00 | 41.40 | 78.81 | 97.50 | 0.0447 | 0.0605 | 26.92 | 6 |
| 016 | 32.13 | 54.39 | 170.72 | 194.37 | 23.28 | 47.82 | 181.15 | 196.98 | 0.1093 | 0.1259 | 44.22 | 6 |
| 017 | 31.73 | 49.85 | 96.14 | 123.42 | 23.44 | 43.11 | 99.99 | 118.99 | 0.0258 | 0.0356 | 9.36 | 3 |
| 018 | 34.72 | 52.96 | 104.58 | 134.83 | 27.16 | 45.51 | 107.45 | 129.10 | 0.0463 | 0.0422 | 16.96 | 3 |
| 019 | 35.72 | 48.64 | 55.51 | 94.01 | 28.59 | 41.97 | 50.81 | 81.43 | 0.0382 | 0.0329 | 3.26 | 5 |
| 020 | 35.72 | 50.85 | 57.52 | 96.85 | 27.70 | 40.86 | 50.43 | 79.92 | 0.0501 | 0.0414 | 18.48 | 10 |
| 021 | 36.23 | 44.48 | 98.73 | 125.26 | 29.41 | 41.38 | 104.45 | 124.79 | 0.0370 | 0.0475 | 19.27 | 2 |
| 022 | 38.20 | 65.25 | 69.17 | 116.20 | 28.79 | 50.24 | 52.26 | 88.41 | 0.0336 | 0.0149 | 6.95 | 22 |
| 023 | 47.64 | 78.68 | 84.86 | 142.90 | 31.85 | 68.61 | 72.80 | 119.25 | 0.1052 | 0.0885 | 11.37 | 29 |
| 024 | 39.37 | 61.58 | 75.37 | 121.36 | 29.17 | 53.61 | 63.91 | 101.27 | 0.0774 | 0.0702 | 35.53 | 13 |
| 025 | 34.64 | 58.41 | 60.99 | 105.17 | 24.24 | 47.13 | 50.64 | 84.08 | 0.1013 | 0.1010 | 37.90 | 7 |
| 026 | 34.84 | 50.84 | 57.03 | 96.39 | 24.95 | 44.11 | 50.59 | 81.75 | 0.0488 | 0.0429 | 21.08 | 8 |
| 027 | 33.53 | 57.63 | 39.89 | 89.38 | 24.87 | 44.46 | 21.87 | 61.93 | 0.0192 | 0.0277 | 2.89 | 17 |
| 028 | 36.77 | 61.64 | 48.00 | 98.41 | 25.31 | 47.14 | 27.56 | 67.97 | 0.1081 | 0.1155 | 33.53 | 32 |
| 029 | 36.98 | 60.94 | 50.17 | 99.60 | 25.10 | 46.39 | 25.82 | 65.96 | 0.0579 | 0.0659 | 14.05 | 30 |
| 030 | 36.40 | 54.78 | 59.71 | 101.89 | 27.01 | 46.57 | 51.34 | 84.69 | 0.0553 | 0.0569 | 28.74 | 15 |
| 031 | 37.75 | 51.22 | 102.76 | 133.39 | 27.98 | 45.64 | 105.68 | 127.90 | 0.0426 | 0.0530 | 28.68 | 10 |
| 032 | 36.83 | 47.48 | 53.92 | 91.77 | 29.61 | 42.51 | 51.17 | 82.09 | 0.0280 | 0.0305 | 4.62 | 8 |
| 033 | 37.63 | 46.76 | 27.73 | 75.73 | 30.02 | 41.65 | 19.32 | 61.96 | 0.0658 | 0.0697 | 5.56 | 8 |
| 034 | 36.64 | 50.67 | 55.68 | 95.30 | 29.63 | 43.39 | 50.59 | 82.30 | 0.0477 | 0.0466 | 3.03 | 10 |
| 035 | 32.38 | 46.44 | 24.17 | 69.89 | 24.07 | 40.83 | 17.60 | 56.54 | 0.0478 | 0.0501 | 1.32 | 5 |
| 036 | 32.47 | 48.78 | 35.86 | 80.38 | 24.16 | 42.89 | 20.45 | 60.71 | 0.0362 | 0.0447 | 29.40 | 12 |
| 037 | 36.33 | 67.84 | 49.95 | 105.02 | 24.71 | 50.48 | 24.02 | 68.76 | 0.0795 | 0.0796 | 7.94 | 34 |
| 038 | 38.17 | 58.58 | 49.19 | 98.39 | 25.84 | 48.47 | 27.90 | 69.80 | 0.0820 | 0.0910 | 7.48 | 31 |
| 039 | 38.23 | 52.54 | 40.37 | 88.49 | 27.46 | 44.62 | 22.67 | 64.79 | 0.0696 | 0.0761 | 5.75 | 15 |
| 040 | 37.50 | 53.53 | 33.12 | 84.50 | 28.16 | 44.90 | 20.00 | 63.82 | 0.0817 | 0.0846 | 23.62 | 11 |
| 041 | 37.38 | 51.78 | 29.88 | 80.28 | 28.31 | 43.81 | 19.47 | 62.26 | 0.0524 | 0.0537 | 4.33 | 10 |
| 042 | 36.49 | 57.01 | 39.09 | 90.36 | 28.00 | 47.06 | 19.26 | 64.82 | 0.0803 | 0.0799 | 9.83 | 17 |
| 043 | 49.96 | 96.02 | 89.02 | 160.67 | 31.71 | 80.13 | 60.43 | 120.28 | 0.1545 | 0.1440 | 27.94 | 60 |
| 044 | 42.93 | 62.67 | 63.93 | 113.89 | 30.88 | 57.94 | 50.93 | 94.12 | 0.1014 | 0.0993 | 25.84 | 14 |
| 045 | 43.18 | 69.71 | 54.74 | 114.30 | 30.32 | 55.85 | 25.36 | 77.39 | 0.0828 | 0.0749 | 8.18 | 33 |
| 046 | 40.36 | 54.75 | 51.78 | 100.66 | 28.14 | 49.49 | 39.36 | 82.22 | 0.0263 | 0.0269 | 4.00 | 17 |
| 047 | 39.08 | 59.48 | 147.88 | 180.66 | 32.18 | 52.11 | 150.48 | 174.98 | 0.1214 | 0.1488 | 37.09 | 7 |
| 048 | 35.43 | 50.68 | 61.01 | 97.44 | 24.73 | 47.81 | 51.87 | 83.32 | 0.0543 | 0.0659 | 19.07 | 6 |
| 049 | 33.99 | 47.31 | 21.38 | 70.30 | 24.18 | 45.73 | 14.77 | 59.35 | 0.0127 | 0.0153 | 7.35 | 1 |
| 050 | 32.49 | 46.33 | 24.41 | 70.71 | 23.79 | 43.42 | 16.04 | 58.00 | 0.0063 | 0.0038 | 6.15 | 3 |
| 051 | 32.26 | 48.57 | 25.68 | 72.46 | 24.02 | 44.92 | 15.98 | 58.93 | 0.0110 | 0.0122 | 3.12 | 5 |
| 052 | 31.76 | 55.90 | 38.28 | 86.23 | 23.77 | 47.02 | 19.12 | 62.87 | 0.0280 | 0.0233 | 2.64 | 21 |
| 053 | 32.04 | 46.38 | 25.82 | 70.06 | 24.85 | 43.21 | 19.14 | 59.24 | 0.0600 | 0.0754 | 3.20 | 6 |
| 054 | 29.99 | 54.20 | 35.28 | 80.65 | 22.83 | 44.95 | 23.34 | 62.11 | 0.0327 | 0.0385 | 2.21 | 11 |
| 055 | 32.77 | 60.26 | 46.04 | 94.70 | 23.56 | 46.85 | 23.15 | 64.37 | 0.0577 | 0.0573 | 26.91 | 30 |
| 056 | 34.56 | 52.98 | 41.02 | 85.92 | 23.73 | 43.53 | 25.68 | 62.61 | 0.0365 | 0.0362 | 20.25 | 20 |
| 057 | 33.18 | 54.26 | 56.92 | 97.05 | 23.79 | 44.64 | 46.28 | 77.45 | 0.0358 | 0.0319 | 26.08 | 16 |
| 058 | 33.06 | 50.57 | 33.94 | 78.40 | 23.54 | 43.23 | 22.98 | 60.23 | 0.0194 | 0.0248 | 3.88 | 13 |
| 059 | 35.28 | 53.59 | 38.72 | 85.25 | 25.71 | 44.96 | 25.65 | 64.83 | 0.0349 | 0.0407 | 27.58 | 16 |
| 060 | 32.36 | 47.58 | 48.89 | 84.85 | 22.63 | 42.32 | 45.79 | 73.96 | 0.0197 | 0.0294 | 25.49 | 7 |
| 061 | 33.91 | 62.47 | 47.95 | 98.14 | 23.22 | 47.89 | 27.79 | 68.04 | 0.0531 | 0.0482 | 25.49 | 21 |
| 062 | 34.11 | 51.52 | 33.20 | 79.40 | 22.72 | 44.12 | 24.08 | 61.65 | 0.0448 | 0.0511 | 13.08 | 11 |
| 063 | 32.54 | 46.84 | 29.32 | 72.27 | 23.14 | 42.46 | 22.07 | 59.08 | 0.0361 | 0.0406 | 10.61 | 5 |
| 064 | 31.27 | 46.04 | 25.56 | 68.71 | 23.04 | 42.01 | 20.88 | 58.14 | 0.0321 | 0.0364 | 7.05 | 3 |
| 065 | 30.63 | 49.42 | 30.94 | 74.72 | 22.19 | 42.89 | 20.78 | 58.43 | 0.0259 | 0.0300 | 9.94 | 6 |
| 066 | 30.88 | 58.34 | 39.61 | 87.39 | 22.38 | 44.23 | 23.72 | 61.43 | 0.0369 | 0.0471 | 10.36 | 12 |
| 067 | 33.70 | 61.96 | 46.38 | 95.12 | 23.31 | 47.03 | 28.71 | 66.45 | 0.0652 | 0.0672 | 38.87 | 16 |
| 068 | 34.62 | 62.87 | 48.27 | 98.24 | 24.74 | 47.70 | 27.13 | 67.53 | 0.0406 | 0.0319 | 3.72 | 14 |
| 069 | 36.23 | 49.03 | 27.71 | 75.19 | 27.21 | 43.67 | 22.11 | 62.39 | 0.0656 | 0.0695 | 4.02 | 4 |
| 070 | 36.19 | 54.38 | 56.77 | 98.44 | 27.38 | 46.09 | 46.00 | 80.08 | 0.0446 | 0.0352 | 4.43 | 9 |
| 071 | 37.33 | 59.31 | 47.78 | 96.29 | 26.79 | 48.43 | 28.23 | 69.46 | 0.0611 | 0.0542 | 7.97 | 13 |
| 072 | 34.12 | 59.32 | 39.34 | 88.67 | 24.41 | 45.05 | 24.40 | 63.30 | 0.0455 | 0.0471 | 18.02 | 19 |
| 073 | 34.49 | 49.47 | 31.47 | 77.08 | 24.67 | 42.93 | 22.95 | 60.93 | 0.0358 | 0.0425 | 0.14 | 4 |
| 074 | 34.80 | 51.04 | 33.04 | 79.02 | 26.34 | 43.47 | 22.63 | 62.04 | 0.0367 | 0.0453 | 4.90 | 6 |

| | | | | | | | | | | | | |
|-----|-------|--------|-------|--------|-------|--------|-------|--------|--------|--------|--------|----|
| 075 | 32.69 | 48.00 | 26.52 | 71.91 | 24.36 | 41.95 | 21.61 | 59.56 | 0.0504 | 0.0590 | 11.18 | 2 |
| 076 | 30.38 | 44.68 | 24.96 | 66.96 | 23.57 | 41.22 | 21.69 | 58.43 | 0.0497 | 0.0552 | 2.04 | 2 |
| 077 | 30.42 | 48.58 | 27.40 | 71.14 | 24.22 | 43.03 | 22.35 | 60.64 | 0.0502 | 0.0503 | 2.34 | 4 |
| 078 | 30.46 | 48.21 | 29.26 | 73.01 | 24.55 | 43.53 | 22.76 | 61.78 | 0.0558 | 0.0595 | 1.67 | 6 |
| 079 | 31.27 | 52.70 | 34.30 | 80.46 | 24.72 | 43.11 | 22.09 | 61.60 | 0.0358 | 0.0363 | 22.47 | 7 |
| 080 | 33.47 | 55.62 | 52.54 | 97.21 | 28.24 | 46.66 | 42.91 | 81.45 | 0.1010 | 0.1113 | 9.22 | 6 |
| 081 | 32.65 | 53.30 | 24.57 | 76.17 | 27.31 | 47.67 | 18.26 | 64.41 | 0.0747 | 0.0844 | 0.79 | 4 |
| 082 | 31.56 | 56.90 | 37.15 | 85.60 | 26.44 | 48.33 | 23.61 | 67.08 | 0.0798 | 0.0948 | 13.29 | 12 |
| 083 | 32.47 | 59.45 | 38.60 | 88.95 | 25.42 | 46.76 | 21.41 | 64.09 | 0.0537 | 0.0637 | 6.03 | 14 |
| 084 | 33.57 | 54.57 | 34.49 | 83.02 | 26.36 | 49.96 | 22.72 | 67.56 | 0.0480 | 0.0593 | 5.14 | 11 |
| 085 | 33.94 | 55.68 | 31.76 | 82.75 | 26.33 | 47.47 | 20.54 | 64.81 | 0.0607 | 0.0698 | 7.23 | 8 |
| 086 | 33.56 | 51.45 | 27.89 | 77.03 | 26.78 | 47.20 | 21.61 | 65.14 | 0.0852 | 0.0980 | 6.06 | 3 |
| 087 | 32.06 | 49.81 | 28.59 | 75.15 | 25.49 | 45.55 | 22.93 | 63.97 | 0.0124 | 0.0105 | 2.32 | 4 |
| 088 | 31.41 | 48.83 | 31.61 | 74.79 | 23.47 | 42.08 | 25.76 | 61.57 | 0.0313 | 0.0337 | 11.30 | 4 |
| 089 | 31.90 | 50.05 | 34.69 | 78.98 | 24.61 | 42.75 | 27.02 | 63.94 | 0.0222 | 0.0257 | 9.53 | 10 |
| 090 | 32.79 | 49.56 | 38.67 | 80.98 | 25.29 | 42.96 | 25.85 | 63.35 | 0.0097 | 0.0115 | 6.51 | 12 |
| 091 | 38.82 | 69.10 | 58.56 | 111.63 | 29.79 | 51.76 | 35.00 | 78.66 | 0.1262 | 0.1193 | 23.05 | 23 |
| 092 | 41.32 | 57.01 | 41.99 | 93.22 | 33.70 | 46.84 | 28.34 | 72.41 | 0.0794 | 0.0751 | 1.13 | 13 |
| 093 | 40.91 | 70.33 | 57.96 | 112.54 | 29.90 | 54.86 | 42.15 | 84.80 | 0.1065 | 0.1007 | 46.94 | 15 |
| 094 | 35.96 | 67.37 | 42.68 | 99.29 | 26.39 | 53.18 | 27.24 | 73.30 | 0.0646 | 0.0604 | 11.99 | 9 |
| 095 | 38.83 | 66.93 | 46.27 | 103.94 | 26.94 | 57.59 | 27.68 | 77.92 | 0.0359 | 0.0324 | 7.21 | 22 |
| 096 | 36.83 | 59.62 | 33.78 | 88.57 | 26.58 | 51.80 | 23.45 | 69.82 | 0.0449 | 0.0432 | 17.56 | 11 |
| 097 | 49.15 | 112.13 | 67.36 | 157.47 | 36.17 | 96.54 | 47.68 | 128.35 | 0.1605 | 0.1833 | 39.04 | 82 |
| 098 | 66.85 | 114.35 | 59.69 | 165.60 | 44.44 | 117.50 | 47.64 | 149.19 | 0.1398 | 0.1180 | 72.17 | 74 |
| 099 | 46.10 | 64.53 | 56.38 | 112.81 | 31.85 | 56.96 | 48.43 | 94.20 | 0.1163 | 0.1150 | 68.73 | 10 |
| 100 | 40.92 | 59.17 | 44.75 | 96.38 | 27.99 | 49.56 | 31.33 | 73.51 | 0.0783 | 0.0840 | 27.62 | 14 |
| 101 | 41.04 | 70.29 | 53.17 | 110.10 | 27.17 | 53.91 | 35.91 | 79.11 | 0.1023 | 0.1035 | 66.76 | 19 |
| 102 | 37.95 | 55.02 | 41.53 | 89.46 | 26.55 | 46.01 | 27.16 | 66.77 | 0.0616 | 0.0579 | 35.26 | 9 |
| 103 | 36.15 | 51.73 | 32.56 | 80.11 | 26.00 | 43.44 | 25.32 | 63.48 | 0.0381 | 0.0340 | 30.86 | 7 |
| 104 | 36.85 | 52.40 | 33.59 | 81.88 | 26.50 | 43.94 | 26.22 | 64.51 | 0.0259 | 0.0204 | 28.41 | 6 |
| 105 | 33.52 | 47.75 | 29.42 | 74.33 | 24.63 | 44.05 | 23.18 | 62.21 | 0.0425 | 0.0452 | 13.07 | 2 |
| 106 | 34.10 | 54.61 | 33.30 | 83.36 | 26.08 | 47.88 | 24.06 | 67.57 | 0.0619 | 0.0657 | 13.90 | 6 |
| 107 | 40.18 | 78.13 | 54.75 | 117.46 | 28.97 | 58.79 | 32.97 | 82.94 | 0.0472 | 0.0361 | 73.33 | 22 |
| 108 | 37.43 | 55.17 | 52.51 | 96.63 | 27.81 | 46.40 | 46.47 | 80.76 | 0.0398 | 0.0490 | 44.56 | 12 |
| 109 | 35.35 | 50.13 | 32.01 | 79.25 | 26.45 | 45.07 | 24.26 | 65.28 | 0.0511 | 0.0550 | 20.20 | 6 |
| 110 | 34.98 | 60.40 | 43.68 | 94.98 | 27.46 | 47.10 | 25.59 | 68.62 | 0.0289 | 0.0285 | 30.63 | 12 |
| 111 | 32.97 | 53.59 | 58.14 | 96.58 | 23.88 | 44.46 | 48.21 | 78.27 | 0.0396 | 0.0473 | 34.32 | 13 |
| 112 | 33.17 | 48.21 | 32.47 | 75.59 | 24.56 | 42.16 | 23.91 | 60.46 | 0.0261 | 0.0229 | 11.31 | 10 |
| 113 | 32.06 | 49.48 | 55.52 | 90.55 | 23.92 | 41.68 | 48.30 | 75.52 | 0.0200 | 0.0278 | 17.35 | 5 |
| 114 | 31.11 | 47.23 | 33.64 | 75.09 | 23.05 | 41.09 | 23.51 | 59.30 | 0.0267 | 0.0292 | 6.82 | 6 |
| 115 | 34.12 | 61.57 | 42.47 | 94.52 | 23.47 | 50.16 | 27.12 | 70.14 | 0.0396 | 0.0367 | 32.87 | 21 |
| 116 | 35.48 | 49.95 | 49.33 | 89.81 | 25.42 | 46.79 | 45.57 | 79.47 | 0.0318 | 0.0423 | 32.90 | 5 |
| 117 | 34.55 | 50.95 | 29.00 | 77.64 | 26.08 | 45.63 | 23.14 | 65.42 | 0.0549 | 0.0586 | 17.29 | 2 |
| 118 | 33.71 | 60.95 | 38.21 | 91.48 | 26.66 | 49.88 | 23.86 | 69.82 | 0.0333 | 0.0361 | 17.38 | 13 |
| 119 | 33.16 | 59.82 | 59.00 | 103.49 | 23.42 | 45.80 | 46.56 | 79.13 | 0.0295 | 0.0370 | 22.19 | 14 |
| 120 | 32.00 | 54.72 | 38.87 | 84.04 | 23.27 | 44.81 | 26.07 | 63.33 | 0.0103 | 0.0122 | 18.02 | 12 |
| 121 | 32.58 | 53.58 | 37.49 | 83.83 | 23.44 | 44.35 | 24.72 | 62.93 | 0.0117 | 0.0174 | 15.23 | 12 |
| 122 | 32.85 | 64.70 | 42.65 | 95.19 | 23.63 | 47.93 | 24.96 | 65.76 | 0.0833 | 0.1037 | 59.97 | 15 |
| 123 | 35.39 | 68.91 | 67.39 | 117.27 | 26.51 | 49.16 | 48.11 | 83.61 | 0.0481 | 0.0515 | 30.02 | 21 |
| 124 | 35.09 | 56.32 | 39.22 | 87.87 | 26.22 | 45.01 | 25.73 | 65.39 | 0.0340 | 0.0351 | 13.00 | 17 |
| 125 | 33.71 | 50.93 | 36.46 | 80.41 | 25.39 | 42.30 | 25.57 | 61.78 | 0.0243 | 0.0239 | 8.30 | 6 |
| 126 | 35.33 | 54.77 | 40.12 | 86.17 | 28.63 | 42.60 | 27.07 | 64.57 | 0.0432 | 0.0382 | 18.18 | 10 |
| 127 | 34.88 | 58.07 | 43.84 | 91.05 | 27.54 | 42.69 | 28.72 | 64.89 | 0.0603 | 0.0599 | 25.45 | 11 |
| 128 | 32.19 | 52.46 | 36.36 | 81.37 | 24.76 | 41.90 | 26.53 | 62.08 | 0.0292 | 0.0326 | 16.80 | 5 |
| 129 | 29.30 | 46.66 | 30.47 | 71.02 | 23.88 | 41.52 | 22.78 | 59.27 | 0.0270 | 0.0276 | 7.69 | 4 |
| 130 | 28.50 | 55.54 | 39.96 | 84.26 | 21.47 | 44.50 | 24.76 | 62.08 | 0.0257 | 0.0280 | 5.50 | 8 |
| 131 | 30.00 | 55.08 | 37.81 | 83.49 | 22.16 | 43.52 | 23.64 | 60.85 | 0.0164 | 0.0224 | 17.92 | 6 |
| 132 | 29.15 | 54.68 | 52.67 | 91.83 | 22.20 | 43.02 | 44.71 | 73.32 | 0.0305 | 0.0361 | 23.06 | 4 |
| 133 | 30.61 | 61.81 | 53.20 | 98.56 | 22.90 | 45.49 | 28.30 | 65.07 | 0.0831 | 0.0863 | 51.20 | 15 |
| 134 | 30.64 | 53.31 | 39.17 | 83.66 | 23.49 | 43.67 | 23.66 | 61.61 | 0.0511 | 0.0597 | 15.86 | 14 |
| 135 | 30.37 | 51.84 | 45.28 | 85.96 | 23.77 | 42.08 | 29.72 | 64.09 | 0.0189 | 0.0176 | 13.33 | 9 |
| 136 | 47.12 | 73.56 | 98.23 | 146.66 | 48.27 | 57.25 | 71.36 | 115.69 | 0.1194 | 0.1217 | 2.73 | 12 |
| 137 | 32.76 | 63.49 | 48.69 | 98.81 | 27.11 | 46.04 | 27.05 | 67.65 | 0.0747 | 0.0697 | 1.39 | 16 |
| 138 | 38.11 | 69.98 | 48.24 | 105.88 | 24.44 | 58.18 | 33.79 | 80.32 | 0.0928 | 0.0969 | 72.33 | 28 |
| 139 | 32.60 | 53.56 | 34.07 | 80.94 | 24.17 | 44.62 | 23.08 | 61.89 | 0.0338 | 0.0364 | 25.24 | 7 |
| 140 | 34.80 | 48.12 | 34.32 | 78.20 | 27.92 | 41.29 | 22.67 | 61.30 | 0.0389 | 0.0379 | 12.94 | 7 |
| 141 | 34.08 | 50.00 | 39.92 | 81.89 | 28.72 | 43.65 | 28.04 | 66.13 | 0.0457 | 0.0490 | 8.62 | 4 |
| 142 | 30.29 | 51.31 | 37.03 | 79.66 | 23.05 | 43.27 | 24.64 | 61.10 | 0.0352 | 0.0391 | 22.79 | 5 |
| 143 | 30.56 | 53.10 | 75.51 | 108.77 | 24.36 | 42.75 | 66.16 | 91.03 | 0.1524 | 0.1771 | 56.44 | 8 |
| 144 | 32.63 | 56.97 | 66.30 | 104.22 | 27.18 | 46.67 | 56.29 | 86.07 | 0.0797 | 0.0968 | 13.58 | 29 |
| 145 | 45.57 | 107.50 | 84.48 | 163.46 | 30.57 | 85.65 | 52.15 | 117.53 | 0.1795 | 0.1528 | 122.23 | 93 |

| | | | | | | | | | | | | |
|-----|-------|--------|--------|--------|-------|--------|-------|--------|--------|--------|-------|-----|
| 146 | 41.03 | 79.19 | 58.14 | 121.44 | 28.63 | 59.24 | 29.41 | 81.26 | 0.0866 | 0.0675 | 58.72 | 28 |
| 147 | 38.04 | 62.14 | 43.92 | 96.85 | 28.46 | 47.53 | 23.83 | 67.67 | 0.1046 | 0.0923 | 51.02 | 15 |
| 148 | 38.24 | 53.96 | 35.44 | 85.37 | 31.52 | 43.73 | 21.85 | 64.63 | 0.0826 | 0.0676 | 17.39 | 8 |
| 149 | 36.90 | 54.41 | 39.62 | 88.12 | 29.33 | 44.60 | 23.54 | 65.66 | 0.0902 | 0.0810 | 26.47 | 9 |
| 150 | 35.85 | 61.24 | 45.92 | 97.35 | 28.37 | 47.05 | 23.07 | 67.03 | 0.0728 | 0.0599 | 17.81 | 24 |
| 151 | 34.64 | 70.20 | 68.35 | 118.38 | 26.52 | 50.39 | 51.50 | 87.06 | 0.0993 | 0.0956 | 20.57 | 22 |
| 152 | 30.77 | 53.16 | 34.43 | 79.68 | 21.37 | 43.60 | 25.05 | 60.83 | 0.0162 | 0.0182 | 30.82 | 10 |
| 153 | 30.58 | 54.75 | 34.88 | 80.92 | 22.91 | 42.64 | 24.30 | 60.30 | 0.0143 | 0.0141 | 27.68 | 8 |
| 154 | 31.20 | 49.52 | 52.95 | 89.57 | 25.13 | 41.48 | 46.20 | 75.59 | 0.0152 | 0.0166 | 13.74 | 6 |
| 155 | 32.19 | 58.15 | 59.82 | 101.21 | 25.54 | 43.15 | 47.01 | 77.74 | 0.0298 | 0.0278 | 21.73 | 11 |
| 156 | 31.50 | 50.82 | 34.74 | 78.16 | 24.38 | 42.63 | 23.72 | 60.73 | 0.0182 | 0.0148 | 18.22 | 12 |
| 157 | 31.07 | 68.36 | 55.64 | 105.84 | 22.44 | 46.13 | 31.85 | 67.55 | 0.0112 | 0.0136 | 27.66 | 24 |
| 158 | 28.20 | 53.87 | 37.56 | 81.27 | 21.20 | 43.00 | 25.08 | 60.64 | 0.0025 | 0.0118 | 18.08 | 15 |
| 159 | 30.36 | 53.34 | 36.43 | 81.31 | 23.61 | 43.27 | 22.52 | 60.40 | 0.0408 | 0.0451 | 6.85 | 11 |
| 160 | 38.31 | 79.22 | 81.30 | 137.16 | 28.85 | 56.28 | 52.74 | 94.07 | 0.0800 | 0.0739 | 5.83 | 64 |
| 161 | 37.74 | 49.27 | 31.07 | 78.47 | 29.39 | 45.83 | 24.48 | 66.55 | 0.0595 | 0.0553 | 21.87 | 5 |
| 162 | 36.83 | 66.56 | 59.50 | 111.04 | 28.97 | 52.31 | 30.99 | 76.29 | 0.1158 | 0.1194 | 40.38 | 21 |
| 163 | 36.28 | 61.48 | 112.93 | 148.41 | 28.87 | 47.35 | 99.45 | 125.49 | 0.0842 | 0.1007 | 17.44 | 25 |
| 164 | 35.95 | 53.93 | 38.01 | 85.97 | 28.58 | 45.37 | 26.78 | 67.28 | 0.0672 | 0.0694 | 20.93 | 15 |
| 165 | 30.94 | 55.02 | 40.33 | 84.91 | 24.06 | 42.98 | 24.65 | 61.49 | 0.0463 | 0.0444 | 16.75 | 10 |
| 166 | 29.89 | 59.06 | 59.92 | 100.45 | 23.89 | 45.03 | 47.06 | 77.08 | 0.0263 | 0.0346 | 5.57 | 29 |
| 167 | 30.44 | 56.24 | 63.26 | 101.79 | 22.99 | 45.17 | 48.18 | 78.81 | 0.0256 | 0.0411 | 37.14 | 23 |
| 168 | 29.86 | 47.25 | 31.02 | 72.38 | 22.15 | 42.13 | 23.57 | 59.13 | 0.0231 | 0.0218 | 27.41 | 5 |
| 169 | 31.73 | 46.48 | 32.22 | 73.74 | 26.97 | 41.07 | 23.39 | 61.06 | 0.0333 | 0.0275 | 6.80 | 6 |
| 170 | 36.84 | 49.59 | 38.07 | 82.94 | 32.92 | 44.02 | 24.84 | 67.61 | 0.0719 | 0.0764 | 0.79 | 10 |
| 171 | 35.02 | 49.79 | 34.29 | 79.50 | 30.22 | 42.17 | 25.55 | 65.23 | 0.0518 | 0.0522 | 10.02 | 6 |
| 172 | 29.62 | 48.80 | 37.99 | 78.06 | 23.83 | 40.42 | 25.24 | 59.96 | 0.0310 | 0.0258 | 10.21 | 6 |
| 173 | 28.20 | 48.61 | 35.23 | 75.79 | 22.67 | 42.89 | 23.95 | 60.54 | 0.0189 | 0.0199 | 13.49 | 6 |
| 174 | 27.84 | 52.71 | 54.90 | 90.45 | 22.78 | 41.97 | 46.86 | 73.76 | 0.0562 | 0.0739 | 0.80 | 11 |
| 175 | 30.26 | 64.33 | 50.14 | 99.47 | 24.66 | 47.67 | 27.93 | 67.58 | 0.0460 | 0.0567 | 5.19 | 27 |
| 176 | 31.37 | 55.39 | 38.25 | 84.47 | 23.56 | 43.83 | 25.87 | 62.72 | 0.0326 | 0.0336 | 37.56 | 15 |
| 177 | 30.53 | 47.03 | 32.39 | 73.30 | 24.46 | 41.22 | 22.88 | 58.97 | 0.0304 | 0.0288 | 2.41 | 6 |
| 178 | 36.09 | 89.58 | 80.66 | 142.66 | 26.84 | 58.31 | 51.89 | 93.83 | 0.1030 | 0.0986 | 32.16 | 40 |
| 179 | 33.69 | 59.11 | 53.29 | 97.62 | 24.05 | 46.81 | 37.82 | 72.29 | 0.0574 | 0.0625 | 38.30 | 18 |
| 180 | 34.83 | 58.56 | 69.94 | 110.91 | 27.09 | 45.97 | 54.84 | 86.69 | 0.1313 | 0.1218 | 49.74 | 10 |
| 181 | 36.54 | 62.96 | 51.33 | 103.17 | 28.70 | 46.43 | 28.13 | 69.61 | 0.1075 | 0.0960 | 41.08 | 8 |
| 182 | 32.42 | 50.35 | 42.24 | 84.52 | 26.23 | 42.99 | 27.20 | 64.30 | 0.0644 | 0.0539 | 5.79 | 4 |
| 183 | 30.10 | 51.73 | 33.34 | 77.07 | 24.09 | 41.07 | 23.51 | 58.98 | 0.0056 | 0.0152 | 15.33 | 7 |
| 184 | 30.25 | 46.35 | 29.40 | 70.23 | 25.88 | 40.83 | 21.89 | 58.71 | 0.0211 | 0.0227 | 2.30 | 4 |
| 185 | 29.12 | 52.62 | 36.77 | 79.48 | 24.96 | 41.52 | 24.51 | 60.56 | 0.0074 | 0.0024 | 6.94 | 8 |
| 186 | 27.69 | 55.44 | 36.48 | 81.73 | 22.40 | 43.37 | 24.08 | 60.84 | 0.0170 | 0.0126 | 11.84 | 8 |
| 187 | 26.58 | 57.02 | 40.13 | 85.10 | 20.73 | 43.33 | 24.97 | 60.66 | 0.0159 | 0.0130 | 18.80 | 9 |
| 188 | 26.79 | 48.19 | 37.86 | 76.22 | 20.81 | 41.40 | 24.74 | 59.05 | 0.0246 | 0.0224 | 18.59 | 5 |
| 189 | 29.20 | 48.06 | 32.10 | 73.03 | 24.08 | 39.82 | 22.43 | 57.44 | 0.0132 | 0.0144 | 11.75 | 5 |
| 190 | 29.84 | 47.79 | 36.42 | 77.01 | 24.89 | 41.83 | 23.83 | 60.53 | 0.0329 | 0.0347 | 13.20 | 6 |
| 191 | 32.72 | 48.71 | 34.05 | 77.03 | 29.26 | 41.46 | 23.32 | 62.23 | 0.0388 | 0.0355 | 4.65 | 6 |
| 192 | 31.95 | 58.26 | 45.54 | 91.78 | 28.97 | 42.09 | 26.56 | 64.82 | 0.0588 | 0.0634 | 14.04 | 20 |
| 193 | 30.23 | 68.23 | 60.44 | 110.34 | 25.69 | 49.27 | 27.83 | 69.83 | 0.0739 | 0.0770 | 27.45 | 34 |
| 194 | 32.10 | 50.81 | 37.00 | 80.14 | 26.16 | 45.36 | 27.73 | 66.10 | 0.0141 | 0.0310 | 18.04 | 9 |
| 195 | 31.69 | 59.97 | 69.21 | 110.00 | 24.64 | 45.73 | 49.01 | 81.25 | 0.0494 | 0.0478 | 17.56 | 42 |
| 196 | 32.46 | 69.62 | 55.55 | 108.53 | 24.64 | 49.57 | 30.74 | 70.74 | 0.0433 | 0.0577 | 10.14 | 51 |
| 197 | 55.51 | 133.64 | 98.00 | 199.10 | 36.07 | 103.88 | 60.92 | 142.89 | 0.1906 | 0.2352 | 93.47 | 164 |
| 198 | 62.29 | 121.43 | 60.51 | 171.89 | 42.96 | 123.96 | 42.92 | 151.55 | 0.1311 | 0.1069 | 61.41 | 50 |
| 199 | 55.24 | 60.65 | 33.45 | 99.72 | 46.76 | 61.11 | 27.65 | 90.25 | 0.1475 | 0.1422 | 32.86 | 8 |
| 200 | 47.50 | 59.38 | 37.14 | 95.34 | 41.68 | 50.52 | 26.18 | 78.05 | 0.1046 | 0.1038 | 31.46 | 12 |
| 201 | 44.68 | 58.09 | 38.27 | 93.77 | 39.42 | 49.16 | 27.48 | 76.48 | 0.0932 | 0.0953 | 20.60 | 14 |
| 202 | 47.85 | 90.77 | 66.02 | 138.44 | 37.88 | 71.37 | 40.44 | 101.58 | 0.1895 | 0.1846 | 73.81 | 36 |
| 203 | 37.72 | 53.16 | 37.04 | 85.60 | 25.74 | 50.17 | 26.13 | 69.59 | 0.0476 | 0.0482 | 31.42 | 7 |
| 204 | 35.24 | 68.00 | 51.51 | 106.75 | 24.37 | 54.61 | 29.44 | 75.62 | 0.0696 | 0.0669 | 30.64 | 12 |
| 205 | 35.87 | 66.60 | 43.61 | 100.32 | 25.97 | 53.76 | 28.01 | 74.16 | 0.0597 | 0.0643 | 7.40 | 23 |
| 206 | 36.29 | 58.09 | 39.49 | 90.58 | 26.47 | 49.60 | 28.27 | 70.77 | 0.0399 | 0.0396 | 29.86 | 5 |
| 207 | 34.27 | 53.01 | 34.40 | 81.62 | 25.38 | 44.90 | 23.89 | 63.41 | 0.0322 | 0.0310 | 32.83 | 5 |
| 208 | 34.14 | 69.18 | 53.76 | 107.57 | 24.79 | 51.50 | 32.39 | 74.26 | 0.0675 | 0.0628 | 20.81 | 19 |
| 209 | 37.53 | 51.99 | 52.20 | 93.84 | 28.68 | 47.13 | 46.89 | 82.04 | 0.0572 | 0.0622 | 32.61 | 7 |
| 210 | 41.43 | 77.46 | 62.33 | 125.21 | 32.65 | 51.33 | 29.94 | 78.17 | 0.0266 | 0.0286 | 57.65 | 32 |
| 211 | 45.27 | 79.83 | 55.71 | 124.45 | 36.78 | 56.86 | 32.95 | 86.37 | 0.0196 | 0.0065 | 81.92 | 27 |
| 212 | 37.29 | 52.33 | 34.39 | 83.04 | 27.55 | 44.38 | 24.77 | 64.77 | 0.0161 | 0.0290 | 36.72 | 8 |
| 213 | 36.11 | 63.01 | 48.88 | 99.69 | 27.87 | 47.52 | 30.47 | 70.57 | 0.0154 | 0.0078 | 15.22 | 21 |
| 214 | 35.10 | 57.14 | 46.88 | 93.71 | 25.45 | 47.31 | 28.19 | 68.45 | 0.0415 | 0.0470 | 33.43 | 12 |
| 215 | 34.38 | 58.85 | 41.97 | 91.65 | 24.24 | 45.49 | 26.38 | 65.54 | 0.0296 | 0.0331 | 45.82 | 10 |
| 216 | 32.83 | 51.72 | 37.65 | 82.17 | 23.45 | 42.65 | 24.16 | 61.12 | 0.0127 | 0.0159 | 31.80 | 9 |

| | | | | | | | | | | | | |
|-----|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|-----|
| 217 | 35.21 | 62.56 | 46.12 | 98.11 | 26.36 | 49.44 | 27.89 | 71.05 | 0.0097 | 0.0075 | 49.00 | 17 |
| 218 | 38.29 | 62.58 | 51.77 | 104.58 | 30.81 | 50.42 | 30.40 | 76.91 | 0.0374 | 0.0424 | 43.18 | 25 |
| 219 | 34.82 | 62.18 | 45.15 | 96.07 | 23.74 | 48.61 | 28.97 | 68.85 | 0.0590 | 0.0644 | 44.61 | 16 |
| 220 | 33.30 | 50.65 | 36.41 | 80.52 | 23.93 | 43.79 | 24.93 | 62.39 | 0.0270 | 0.0273 | 14.29 | 7 |
| 221 | 33.62 | 49.05 | 33.85 | 77.49 | 25.27 | 42.99 | 24.59 | 62.03 | 0.0425 | 0.0476 | 14.53 | 6 |
| 222 | 33.77 | 48.05 | 33.36 | 76.71 | 24.68 | 42.79 | 24.42 | 61.53 | 0.0368 | 0.0395 | 20.67 | 5 |
| 223 | 33.96 | 67.01 | 57.20 | 108.08 | 24.10 | 51.48 | 30.35 | 73.26 | 0.0706 | 0.0706 | 47.08 | 25 |
| 224 | 45.27 | 99.16 | 76.22 | 153.97 | 26.11 | 75.55 | 42.43 | 102.33 | 0.1351 | 0.1380 | 89.26 | 47 |
| 225 | 57.60 | 144.86 | 119.67 | 225.28 | 37.13 | 121.94 | 71.20 | 164.79 | 0.2808 | 0.2802 | 128.82 | 123 |
| 226 | 44.22 | 57.29 | 33.74 | 91.28 | 31.29 | 53.16 | 24.98 | 74.64 | 0.0746 | 0.0654 | 36.14 | 19 |
| 227 | 41.03 | 51.01 | 52.92 | 97.16 | 30.57 | 48.61 | 46.29 | 84.55 | 0.0672 | 0.0629 | 31.49 | 12 |
| 228 | 45.90 | 51.88 | 35.21 | 87.97 | 38.12 | 45.60 | 25.28 | 71.97 | 0.1122 | 0.1157 | 20.77 | 8 |
| 229 | 44.71 | 50.95 | 37.12 | 87.51 | 38.07 | 45.59 | 25.37 | 72.08 | 0.0953 | 0.0963 | 17.94 | 7 |
| 230 | 42.34 | 49.30 | 42.40 | 88.64 | 34.42 | 43.03 | 36.90 | 75.46 | 0.0812 | 0.0726 | 41.70 | 6 |
| 231 | 37.15 | 40.31 | 27.48 | 70.17 | 28.27 | 38.38 | 21.43 | 58.60 | 0.0532 | 0.0435 | 11.80 | 3 |
| 232 | 36.30 | 41.92 | 29.99 | 72.07 | 28.03 | 38.43 | 22.94 | 59.29 | 0.0508 | 0.0453 | 7.68 | 4 |
| 233 | 35.93 | 40.92 | 32.66 | 72.49 | 27.71 | 37.80 | 25.56 | 59.65 | 0.0566 | 0.0508 | 5.34 | 4 |
| 234 | 35.93 | 58.00 | 49.50 | 97.10 | 27.28 | 45.57 | 24.69 | 66.15 | 0.0803 | 0.0734 | 26.38 | 10 |
| 235 | 35.60 | 46.01 | 27.54 | 72.23 | 26.38 | 41.82 | 22.82 | 60.62 | 0.0288 | 0.0266 | 19.16 | 2 |
| 236 | 35.31 | 49.93 | 56.15 | 94.71 | 26.49 | 43.64 | 46.53 | 78.53 | 0.0413 | 0.0473 | 37.46 | 7 |
| 237 | 33.35 | 50.52 | 32.55 | 78.08 | 24.39 | 41.82 | 22.83 | 60.44 | 0.0153 | 0.0106 | 34.81 | 8 |
| 238 | 34.05 | 46.95 | 27.95 | 72.84 | 25.66 | 42.69 | 20.91 | 60.19 | 0.0190 | 0.0205 | 13.10 | 3 |
| 239 | 33.61 | 49.77 | 32.83 | 77.65 | 25.23 | 42.22 | 23.63 | 61.32 | 0.0295 | 0.0273 | 29.02 | 5 |
| 240 | 34.10 | 46.06 | 29.58 | 73.06 | 26.98 | 41.03 | 22.01 | 59.98 | 0.0113 | 0.0108 | 3.48 | 7 |
| 241 | 35.37 | 55.17 | 46.99 | 92.79 | 26.70 | 45.49 | 29.02 | 68.58 | 0.0216 | 0.0161 | 1.71 | 27 |
| 242 | 40.39 | 71.05 | 55.96 | 112.52 | 28.63 | 51.24 | 34.81 | 77.43 | 0.0936 | 0.1019 | 43.17 | 35 |
| 243 | 38.74 | 49.45 | 37.73 | 83.37 | 28.25 | 43.89 | 26.37 | 65.79 | 0.0361 | 0.0375 | 18.71 | 12 |
| 244 | 36.61 | 53.99 | 42.92 | 88.68 | 26.44 | 45.11 | 28.67 | 67.14 | 0.0359 | 0.0382 | 22.14 | 14 |
| 245 | 35.84 | 56.51 | 39.18 | 88.32 | 25.20 | 46.91 | 26.66 | 67.30 | 0.0280 | 0.0365 | 25.37 | 16 |
| 246 | 37.90 | 75.19 | 55.34 | 114.98 | 25.84 | 54.96 | 32.86 | 77.75 | 0.0497 | 0.0527 | 57.84 | 23 |
| 247 | 35.51 | 45.98 | 29.15 | 74.30 | 25.27 | 42.17 | 23.44 | 61.37 | 0.0319 | 0.0349 | 22.24 | 7 |
| 248 | 41.68 | 55.63 | 40.68 | 92.50 | 32.51 | 49.37 | 30.23 | 75.15 | 0.0346 | 0.0297 | 2.92 | 18 |
| 249 | 37.54 | 51.61 | 58.09 | 98.34 | 28.20 | 47.59 | 50.46 | 85.08 | 0.0990 | 0.1008 | 59.18 | 7 |
| 250 | 38.39 | 45.74 | 32.70 | 78.48 | 30.90 | 41.58 | 21.86 | 63.18 | 0.1052 | 0.1084 | 12.62 | 12 |
| 251 | 38.94 | 58.88 | 52.17 | 100.08 | 28.63 | 44.99 | 27.00 | 66.97 | 0.1179 | 0.1229 | 48.06 | 15 |
| 252 | 37.12 | 55.46 | 47.53 | 94.21 | 27.06 | 46.48 | 25.07 | 66.82 | 0.0500 | 0.0459 | 6.04 | 17 |
| 253 | 35.72 | 46.84 | 27.58 | 73.14 | 26.29 | 42.61 | 22.88 | 61.48 | 0.0222 | 0.0257 | 15.48 | 5 |
| 254 | 34.44 | 45.43 | 27.57 | 71.23 | 26.04 | 41.92 | 22.30 | 60.40 | 0.0178 | 0.0200 | 11.60 | 4 |
| 255 | 33.08 | 45.45 | 28.05 | 71.01 | 25.38 | 42.33 | 22.04 | 60.21 | 0.0271 | 0.0269 | 19.85 | 4 |
| 256 | 37.37 | 65.16 | 51.23 | 104.49 | 27.20 | 54.08 | 31.69 | 78.53 | 0.0921 | 0.0876 | 10.78 | 21 |
| 257 | 43.48 | 53.94 | 36.83 | 88.11 | 34.45 | 45.91 | 27.88 | 71.09 | 0.0805 | 0.0807 | 32.22 | 10 |
| 258 | 39.94 | 50.43 | 33.90 | 81.72 | 31.35 | 44.46 | 24.79 | 66.35 | 0.0681 | 0.0689 | 20.60 | 4 |
| 259 | 34.04 | 49.38 | 32.09 | 77.41 | 26.39 | 43.68 | 22.85 | 62.51 | 0.0215 | 0.0214 | 5.54 | 12 |
| 260 | 35.90 | 62.12 | 50.71 | 100.69 | 25.17 | 50.81 | 32.37 | 73.89 | 0.0541 | 0.0552 | 8.79 | 29 |
| 261 | 44.48 | 86.53 | 59.84 | 129.79 | 30.83 | 70.38 | 42.02 | 98.29 | 0.0683 | 0.0874 | 4.33 | 56 |
| 262 | 53.25 | 88.50 | 55.46 | 135.75 | 35.02 | 87.46 | 37.36 | 113.90 | 0.0620 | 0.0348 | 33.49 | 70 |
| 263 | 44.29 | 68.83 | 47.46 | 108.39 | 28.80 | 58.19 | 32.84 | 83.10 | 0.0815 | 0.0751 | 33.22 | 30 |
| 264 | 42.33 | 52.92 | 34.87 | 87.20 | 29.18 | 48.04 | 26.62 | 70.32 | 0.0586 | 0.0605 | 35.83 | 12 |
| 265 | 43.22 | 51.94 | 35.76 | 86.34 | 32.96 | 45.34 | 26.67 | 69.18 | 0.0756 | 0.0746 | 25.52 | 9 |
| 266 | 40.50 | 49.32 | 32.82 | 80.64 | 30.65 | 43.35 | 26.13 | 66.33 | 0.0523 | 0.0515 | 20.37 | 6 |
| 267 | 38.47 | 46.84 | 32.12 | 77.90 | 27.85 | 42.47 | 24.85 | 63.53 | 0.0325 | 0.0261 | 24.77 | 7 |
| 268 | 35.91 | 51.18 | 35.36 | 82.62 | 25.48 | 44.79 | 25.32 | 64.97 | 0.0262 | 0.0317 | 5.23 | 12 |
| 269 | 38.85 | 63.82 | 50.92 | 103.74 | 26.48 | 50.77 | 33.30 | 75.11 | 0.0463 | 0.0495 | 29.97 | 19 |
| 270 | 41.82 | 64.68 | 53.08 | 106.92 | 28.54 | 52.22 | 33.35 | 77.19 | 0.0766 | 0.0772 | 34.74 | 24 |
| 271 | 39.19 | 54.20 | 38.87 | 87.70 | 28.09 | 46.32 | 29.30 | 68.80 | 0.0616 | 0.0659 | 40.03 | 11 |
| 272 | 40.31 | 52.04 | 43.99 | 90.11 | 28.85 | 45.22 | 29.66 | 68.97 | 0.0863 | 0.0860 | 25.18 | 12 |
| 273 | 42.01 | 49.44 | 34.41 | 83.34 | 32.62 | 44.68 | 26.32 | 68.65 | 0.0724 | 0.0725 | 11.33 | 7 |
| 274 | 45.74 | 86.16 | 67.17 | 133.74 | 31.16 | 63.31 | 41.71 | 92.76 | 0.1584 | 0.1672 | 47.69 | 51 |
| 275 | 43.25 | 52.79 | 35.42 | 86.72 | 30.62 | 46.93 | 27.32 | 69.72 | 0.0656 | 0.0601 | 31.87 | 13 |
| 276 | 40.29 | 56.54 | 43.43 | 93.20 | 29.36 | 46.43 | 29.20 | 70.56 | 0.0736 | 0.0679 | 18.48 | 10 |
| 277 | 116.31 | 141.20 | 75.86 | 238.38 | 123.96 | 110.10 | 50.59 | 205.36 | 0.7436 | 0.5946 | 0.80 | 30 |
| 278 | 53.24 | 98.48 | 74.05 | 153.66 | 36.92 | 84.99 | 51.88 | 121.72 | 0.2065 | 0.1942 | 12.37 | 63 |
| 279 | 73.01 | 124.51 | 86.71 | 189.34 | 49.82 | 115.73 | 59.16 | 154.25 | 0.3537 | 0.3529 | 91.94 | 116 |
| 280 | 53.64 | 55.44 | 28.76 | 93.54 | 38.20 | 58.17 | 25.78 | 83.01 | 0.1020 | 0.0916 | 31.29 | 4 |
| 281 | 45.14 | 54.03 | 33.44 | 87.77 | 32.91 | 48.33 | 27.06 | 72.20 | 0.0917 | 0.0884 | 29.55 | 4 |
| 282 | 41.75 | 46.26 | 28.58 | 77.42 | 30.13 | 43.23 | 24.05 | 65.01 | 0.0602 | 0.0588 | 23.13 | 2 |
| 283 | 38.73 | 46.63 | 31.29 | 77.58 | 28.17 | 42.26 | 23.64 | 62.76 | 0.0460 | 0.0446 | 14.82 | 4 |
| 284 | 37.33 | 56.31 | 41.61 | 89.59 | 26.08 | 45.71 | 27.41 | 66.07 | 0.0614 | 0.0521 | 37.26 | 8 |
| 285 | 37.85 | 60.99 | 48.15 | 97.80 | 25.49 | 47.16 | 31.33 | 70.20 | 0.0623 | 0.0603 | 53.99 | 15 |
| 286 | 39.13 | 47.79 | 33.88 | 79.65 | 28.68 | 43.21 | 27.26 | 65.43 | 0.0582 | 0.0578 | 26.03 | 6 |
| 287 | 40.67 | 63.86 | 63.98 | 113.36 | 27.09 | 51.71 | 46.51 | 84.98 | 0.0870 | 0.0841 | 52.80 | 36 |

| | | | | | | | | | | | | |
|-----|-------|-------|-------|--------|-------|-------|-------|--------|--------|--------|-------|----|
| 288 | 47.13 | 89.36 | 76.49 | 145.54 | 29.72 | 74.91 | 51.34 | 110.06 | 0.1726 | 0.1633 | 84.38 | 45 |
| 289 | 40.82 | 54.03 | 34.26 | 86.59 | 27.63 | 48.20 | 25.13 | 68.29 | 0.0447 | 0.0502 | 24.61 | 8 |
| 290 | 39.40 | 52.53 | 35.07 | 84.74 | 26.34 | 45.86 | 24.88 | 65.88 | 0.0663 | 0.0780 | 28.88 | 10 |
| 291 | 39.32 | 50.45 | 36.17 | 83.65 | 28.98 | 42.95 | 27.07 | 65.86 | 0.0736 | 0.0785 | 22.91 | 11 |
| 292 | 42.70 | 53.44 | 37.99 | 88.57 | 34.16 | 44.43 | 27.90 | 70.53 | 0.0787 | 0.0822 | 18.67 | 9 |
| 293 | 40.09 | 51.94 | 33.33 | 83.73 | 31.00 | 43.86 | 25.12 | 66.56 | 0.0629 | 0.0619 | 18.44 | 9 |
| 294 | 34.30 | 46.70 | 43.86 | 82.58 | 24.82 | 42.60 | 41.72 | 72.86 | 0.0106 | 0.0147 | 25.14 | 3 |
| 295 | 32.98 | 46.86 | 43.19 | 81.70 | 24.27 | 42.93 | 40.49 | 72.08 | 0.0226 | 0.0258 | 22.89 | 3 |
| 296 | 35.37 | 56.73 | 45.60 | 92.70 | 25.56 | 47.25 | 30.53 | 70.33 | 0.0837 | 0.0930 | 1.55 | 16 |
| 297 | 39.72 | 54.03 | 41.03 | 89.41 | 28.09 | 46.70 | 29.38 | 69.29 | 0.0494 | 0.0456 | 34.64 | 15 |
| 298 | 40.36 | 54.51 | 40.48 | 89.94 | 30.10 | 46.57 | 29.51 | 70.54 | 0.0786 | 0.0768 | 33.47 | 9 |
| 299 | 39.71 | 52.88 | 50.67 | 94.68 | 30.18 | 45.51 | 42.73 | 78.99 | 0.0707 | 0.0686 | 25.49 | 6 |
| 300 | 38.50 | 59.17 | 41.17 | 92.58 | 28.21 | 46.70 | 29.52 | 69.37 | 0.0978 | 0.0985 | 46.52 | 8 |
| 301 | 47.45 | 72.74 | 34.16 | 107.03 | 41.67 | 65.33 | 29.38 | 94.39 | 0.0716 | 0.0880 | 96.40 | 4 |
| 302 | 38.27 | 60.72 | 37.93 | 93.44 | 31.35 | 50.95 | 22.47 | 71.42 | 0.0490 | 0.0484 | 1.41 | 20 |
| 303 | 48.14 | 93.13 | 67.49 | 140.89 | 31.74 | 77.45 | 37.92 | 102.17 | 0.1617 | 0.1479 | 56.55 | 34 |
| 304 | 40.74 | 62.85 | 43.70 | 99.35 | 29.68 | 52.56 | 27.55 | 74.34 | 0.0651 | 0.0728 | 1.18 | 15 |

APPENDIX B. LATE CALIBRATION DAILY RESULTS

This data has the same format as that in APPENDIX A, except that it is based on the late calibration.

| | | | | | | | | | | | | |
|-----|-------|-------|--------|--------|-------|-------|--------|--------|--------|--------|-------|----|
| 005 | 33.91 | 65.16 | 179.19 | 207.54 | 22.09 | 57.56 | 186.63 | 205.56 | 0.1631 | 0.1872 | 85.25 | 19 |
| 006 | 32.07 | 54.65 | 39.96 | 86.71 | 22.21 | 45.14 | 22.19 | 62.02 | 0.0760 | 0.0801 | 7.07 | 19 |
| 007 | 32.29 | 47.90 | 28.34 | 74.01 | 23.45 | 41.62 | 16.92 | 56.46 | 0.0328 | 0.0418 | 9.13 | 10 |
| 008 | 31.44 | 52.05 | 156.93 | 179.38 | 23.38 | 45.82 | 169.50 | 184.73 | 0.2012 | 0.2409 | 74.59 | 5 |
| 009 | 29.98 | 47.10 | 61.71 | 92.88 | 22.53 | 42.49 | 63.59 | 87.38 | 0.0110 | 0.0228 | 18.23 | 3 |
| 010 | 29.06 | 57.93 | 150.31 | 175.10 | 21.53 | 48.86 | 161.18 | 176.77 | 0.0984 | 0.1231 | 4.85 | 6 |
| 011 | 31.10 | 67.58 | 49.24 | 104.07 | 22.74 | 53.97 | 26.64 | 73.29 | 0.0639 | 0.0698 | 46.25 | 24 |
| 012 | 35.37 | 59.19 | 56.68 | 102.40 | 25.10 | 52.57 | 49.35 | 85.97 | 0.0523 | 0.0386 | 5.39 | 10 |
| 013 | 33.62 | 53.75 | 28.70 | 79.65 | 24.84 | 46.25 | 17.84 | 61.44 | 0.0606 | 0.0704 | 4.15 | 9 |
| 014 | 29.88 | 50.60 | 64.76 | 98.83 | 21.53 | 42.89 | 65.27 | 88.96 | 0.0579 | 0.0644 | 24.52 | 8 |
| 015 | 29.76 | 49.80 | 73.93 | 104.64 | 21.54 | 41.51 | 78.01 | 97.76 | 0.0641 | 0.0829 | 15.31 | 6 |
| 016 | 29.38 | 55.59 | 171.23 | 194.40 | 21.32 | 48.30 | 182.34 | 197.48 | 0.1316 | 0.1489 | 32.57 | 6 |
| 017 | 29.48 | 51.01 | 95.36 | 122.69 | 21.61 | 43.53 | 100.28 | 118.75 | 0.0472 | 0.0548 | 2.30 | 3 |
| 018 | 30.51 | 54.47 | 105.48 | 134.58 | 23.12 | 46.36 | 108.73 | 128.87 | 0.0453 | 0.0506 | 5.30 | 3 |
| 019 | 31.13 | 50.38 | 56.66 | 93.13 | 24.10 | 42.90 | 52.20 | 80.22 | 0.0246 | 0.0196 | 8.41 | 5 |
| 020 | 31.52 | 52.18 | 60.11 | 96.61 | 23.60 | 41.40 | 52.59 | 79.08 | 0.0514 | 0.0480 | 6.80 | 10 |
| 021 | 31.86 | 46.21 | 99.54 | 124.79 | 25.05 | 42.07 | 105.65 | 124.12 | 0.0560 | 0.0706 | 7.62 | 2 |
| 022 | 34.46 | 66.10 | 72.41 | 116.57 | 25.30 | 50.66 | 52.73 | 86.94 | 0.0307 | 0.0326 | 18.64 | 22 |
| 023 | 42.24 | 79.42 | 86.88 | 141.53 | 26.44 | 68.27 | 72.80 | 115.85 | 0.0983 | 0.0811 | 0.34 | 29 |
| 024 | 36.59 | 61.99 | 78.49 | 120.83 | 26.71 | 53.14 | 66.91 | 100.35 | 0.0635 | 0.0534 | 23.85 | 13 |
| 025 | 31.99 | 58.67 | 62.86 | 104.15 | 21.98 | 46.69 | 51.49 | 82.15 | 0.0897 | 0.0892 | 26.21 | 7 |
| 026 | 31.97 | 51.83 | 58.57 | 95.69 | 22.58 | 44.20 | 52.11 | 80.61 | 0.0336 | 0.0272 | 9.40 | 8 |
| 027 | 30.65 | 59.18 | 41.69 | 90.06 | 22.76 | 45.82 | 21.58 | 62.12 | 0.0205 | 0.0399 | 14.55 | 17 |
| 028 | 33.82 | 61.57 | 46.30 | 95.95 | 22.89 | 46.67 | 21.63 | 63.14 | 0.0938 | 0.1008 | 21.83 | 32 |
| 029 | 34.11 | 60.67 | 48.84 | 97.26 | 22.75 | 45.82 | 20.16 | 61.27 | 0.0451 | 0.0521 | 2.36 | 30 |
| 030 | 33.06 | 55.41 | 63.00 | 101.63 | 24.03 | 46.60 | 53.16 | 83.32 | 0.0506 | 0.0555 | 17.09 | 15 |
| 031 | 33.73 | 52.40 | 104.24 | 133.26 | 24.17 | 45.94 | 106.71 | 126.99 | 0.0577 | 0.0736 | 17.02 | 10 |
| 032 | 32.63 | 49.09 | 56.42 | 91.79 | 25.61 | 43.08 | 53.12 | 81.22 | 0.0414 | 0.0499 | 7.05 | 8 |
| 033 | 33.26 | 47.91 | 28.08 | 74.01 | 25.87 | 41.78 | 16.75 | 58.59 | 0.0550 | 0.0590 | 17.24 | 8 |
| 034 | 32.51 | 52.06 | 58.18 | 95.24 | 25.55 | 43.85 | 52.60 | 81.28 | 0.0529 | 0.0571 | 8.66 | 10 |
| 035 | 30.36 | 47.00 | 23.95 | 69.60 | 22.80 | 40.80 | 15.95 | 55.73 | 0.0268 | 0.0280 | 10.37 | 5 |
| 036 | 30.72 | 49.82 | 36.33 | 80.91 | 23.50 | 43.03 | 19.78 | 60.56 | 0.0206 | 0.0328 | 41.10 | 12 |
| 037 | 33.78 | 68.18 | 51.23 | 105.14 | 22.91 | 50.15 | 22.64 | 67.36 | 0.0637 | 0.0612 | 3.78 | 34 |
| 038 | 35.13 | 58.55 | 49.46 | 97.01 | 23.37 | 47.78 | 24.77 | 66.44 | 0.0674 | 0.0738 | 4.23 | 31 |
| 039 | 34.64 | 52.92 | 42.44 | 87.72 | 24.22 | 44.18 | 22.17 | 62.34 | 0.0561 | 0.0599 | 5.98 | 15 |
| 040 | 33.99 | 53.78 | 35.54 | 83.88 | 24.80 | 44.49 | 19.95 | 61.77 | 0.0808 | 0.0858 | 11.93 | 11 |
| 041 | 33.70 | 51.99 | 34.06 | 80.51 | 24.74 | 43.62 | 21.54 | 61.43 | 0.0519 | 0.0532 | 7.34 | 10 |
| 042 | 32.68 | 57.05 | 43.61 | 90.85 | 24.41 | 46.75 | 21.13 | 63.60 | 0.0695 | 0.0678 | 21.53 | 17 |
| 043 | 45.79 | 95.37 | 95.68 | 162.49 | 27.61 | 79.01 | 64.37 | 120.04 | 0.1483 | 0.1350 | 1.18 | 60 |
| 044 | 38.98 | 62.45 | 68.14 | 113.82 | 26.99 | 57.16 | 52.99 | 92.42 | 0.1127 | 0.1129 | 14.18 | 14 |
| 045 | 39.59 | 69.17 | 58.98 | 114.36 | 26.72 | 54.78 | 26.09 | 74.85 | 0.0809 | 0.0721 | 19.91 | 33 |
| 046 | 38.09 | 54.56 | 57.22 | 102.05 | 26.56 | 48.54 | 41.99 | 81.76 | 0.0059 | 0.0039 | 15.69 | 17 |
| 047 | 37.40 | 56.37 | 148.09 | 178.26 | 30.89 | 49.24 | 151.58 | 173.68 | 0.1041 | 0.1298 | 48.84 | 7 |
| 048 | 34.67 | 50.30 | 65.62 | 100.26 | 25.50 | 47.09 | 54.05 | 85.08 | 0.0733 | 0.0880 | 7.39 | 6 |
| 049 | 33.53 | 47.56 | 30.18 | 74.77 | 24.99 | 45.43 | 20.55 | 62.40 | 0.0315 | 0.0378 | 4.32 | 1 |
| 050 | 32.22 | 46.50 | 34.56 | 75.61 | 24.92 | 43.08 | 24.03 | 62.01 | 0.0285 | 0.0258 | 5.53 | 3 |
| 051 | 31.77 | 49.05 | 36.15 | 77.95 | 24.85 | 44.94 | 23.97 | 63.21 | 0.0117 | 0.0116 | 14.84 | 5 |
| 052 | 31.26 | 56.12 | 46.64 | 90.99 | 24.19 | 47.20 | 25.49 | 66.66 | 0.0187 | 0.0190 | 14.31 | 21 |
| 053 | 31.33 | 46.57 | 30.33 | 72.92 | 25.33 | 43.04 | 21.02 | 60.86 | 0.0534 | 0.0648 | 14.89 | 6 |
| 054 | 30.98 | 53.44 | 31.35 | 79.57 | 25.60 | 44.15 | 18.11 | 60.85 | 0.0248 | 0.0322 | 9.45 | 11 |
| 055 | 33.37 | 58.72 | 43.65 | 92.80 | 25.94 | 45.30 | 17.99 | 61.82 | 0.0403 | 0.0395 | 15.22 | 30 |
| 056 | 32.21 | 52.23 | 36.91 | 81.96 | 22.09 | 42.65 | 18.49 | 57.32 | 0.0388 | 0.0390 | 8.57 | 20 |
| 057 | 30.69 | 53.86 | 58.31 | 95.96 | 21.88 | 43.75 | 47.22 | 75.96 | 0.0510 | 0.0503 | 14.42 | 16 |
| 058 | 30.99 | 50.17 | 29.18 | 74.95 | 22.36 | 42.35 | 16.99 | 56.29 | 0.0030 | 0.0036 | 7.79 | 13 |
| 059 | 35.22 | 52.54 | 33.60 | 82.25 | 27.15 | 43.56 | 17.03 | 60.43 | 0.0136 | 0.0169 | 15.88 | 16 |
| 060 | 32.10 | 47.22 | 48.90 | 84.00 | 23.97 | 41.58 | 45.84 | 73.65 | 0.0179 | 0.0260 | 13.81 | 7 |
| 061 | 34.07 | 60.91 | 44.03 | 94.69 | 24.68 | 46.26 | 20.71 | 63.10 | 0.0433 | 0.0350 | 13.81 | 21 |
| 062 | 32.96 | 51.17 | 29.01 | 76.43 | 22.82 | 43.11 | 18.34 | 58.10 | 0.0260 | 0.0295 | 1.40 | 11 |
| 063 | 31.56 | 46.81 | 24.69 | 69.95 | 23.50 | 41.80 | 16.61 | 56.64 | 0.0139 | 0.0168 | 1.07 | 5 |
| 064 | 30.43 | 46.15 | 20.62 | 66.30 | 23.45 | 41.55 | 15.16 | 55.57 | 0.0105 | 0.0141 | 4.63 | 3 |
| 065 | 30.20 | 49.09 | 27.43 | 72.65 | 23.22 | 42.07 | 15.87 | 56.06 | 0.0077 | 0.0128 | 1.74 | 6 |

| | | | | | | | | | | | | |
|-----|-------|--------|-------|--------|-------|--------|-------|--------|--------|--------|-------|----|
| 066 | 30.08 | 57.69 | 35.37 | 84.52 | 22.72 | 43.35 | 17.72 | 58.25 | 0.0159 | 0.0236 | 1.35 | 12 |
| 067 | 31.63 | 61.12 | 43.61 | 91.67 | 21.85 | 45.99 | 22.61 | 61.58 | 0.0588 | 0.0570 | 27.18 | 16 |
| 068 | 31.61 | 62.12 | 45.53 | 94.58 | 22.15 | 46.60 | 21.94 | 62.65 | 0.0364 | 0.0221 | 7.96 | 14 |
| 069 | 32.42 | 49.41 | 23.27 | 71.14 | 23.52 | 43.29 | 16.27 | 57.38 | 0.0552 | 0.0574 | 7.66 | 4 |
| 070 | 32.26 | 54.30 | 58.32 | 96.89 | 23.76 | 45.55 | 46.76 | 78.16 | 0.0498 | 0.0456 | 16.10 | 9 |
| 071 | 33.65 | 58.16 | 45.27 | 91.90 | 23.34 | 47.01 | 22.05 | 63.07 | 0.0578 | 0.0488 | 3.73 | 13 |
| 072 | 31.33 | 58.23 | 35.68 | 84.46 | 22.04 | 43.82 | 19.18 | 58.36 | 0.0346 | 0.0319 | 6.32 | 19 |
| 073 | 32.02 | 49.07 | 27.53 | 73.32 | 22.83 | 42.09 | 17.94 | 56.81 | 0.0154 | 0.0193 | 11.55 | 4 |
| 074 | 32.64 | 50.59 | 30.61 | 76.04 | 24.96 | 42.60 | 17.68 | 58.07 | 0.0148 | 0.0228 | 6.79 | 6 |
| 075 | 32.81 | 47.73 | 22.55 | 69.69 | 25.88 | 41.26 | 16.21 | 57.28 | 0.0342 | 0.0416 | 0.51 | 2 |
| 076 | 31.04 | 45.11 | 19.64 | 65.93 | 25.94 | 41.34 | 15.53 | 57.51 | 0.0409 | 0.0459 | 13.71 | 2 |
| 077 | 31.38 | 48.91 | 21.59 | 70.18 | 26.87 | 43.14 | 15.85 | 59.87 | 0.0396 | 0.0406 | 9.35 | 4 |
| 078 | 31.92 | 48.07 | 24.66 | 71.91 | 27.87 | 43.35 | 17.21 | 61.02 | 0.0481 | 0.0512 | 10.01 | 6 |
| 079 | 33.03 | 51.90 | 30.57 | 79.28 | 28.46 | 42.26 | 16.95 | 60.53 | 0.0223 | 0.0260 | 10.79 | 7 |
| 080 | 35.72 | 54.94 | 56.98 | 99.66 | 31.65 | 46.42 | 45.01 | 83.13 | 0.1197 | 0.1293 | 20.89 | 6 |
| 081 | 35.05 | 53.08 | 34.57 | 82.49 | 31.57 | 47.73 | 23.94 | 69.39 | 0.0860 | 0.0950 | 10.88 | 4 |
| 082 | 33.42 | 56.68 | 44.99 | 90.97 | 29.83 | 48.67 | 28.11 | 71.45 | 0.0953 | 0.1106 | 1.63 | 12 |
| 083 | 34.32 | 58.41 | 46.34 | 93.71 | 29.31 | 46.04 | 25.55 | 67.58 | 0.0738 | 0.0839 | 17.72 | 14 |
| 084 | 35.89 | 53.30 | 40.95 | 86.95 | 30.13 | 48.58 | 25.71 | 70.11 | 0.0676 | 0.0797 | 6.50 | 11 |
| 085 | 35.26 | 54.22 | 39.46 | 86.49 | 29.06 | 46.39 | 24.16 | 66.93 | 0.0799 | 0.0887 | 4.44 | 8 |
| 086 | 34.69 | 50.36 | 36.75 | 81.60 | 29.31 | 46.59 | 25.69 | 68.09 | 0.1043 | 0.1173 | 5.60 | 3 |
| 087 | 33.04 | 49.29 | 32.55 | 77.53 | 27.83 | 45.08 | 22.76 | 65.05 | 0.0342 | 0.0336 | 14.03 | 4 |
| 088 | 30.29 | 49.23 | 26.95 | 72.08 | 23.37 | 41.80 | 20.03 | 58.39 | 0.0156 | 0.0189 | 0.38 | 4 |
| 089 | 29.97 | 50.41 | 29.52 | 75.25 | 23.40 | 42.68 | 21.44 | 59.98 | 0.0026 | 0.0097 | 2.13 | 10 |
| 090 | 30.09 | 49.54 | 34.21 | 77.05 | 23.05 | 42.65 | 20.17 | 58.75 | 0.0260 | 0.0346 | 5.15 | 12 |
| 091 | 34.39 | 68.12 | 54.94 | 106.37 | 25.31 | 50.73 | 27.34 | 70.89 | 0.1234 | 0.1175 | 11.37 | 23 |
| 092 | 36.64 | 57.42 | 38.30 | 88.90 | 28.71 | 46.70 | 23.36 | 66.96 | 0.0750 | 0.0707 | 10.55 | 13 |
| 093 | 38.68 | 68.75 | 59.01 | 110.44 | 28.29 | 53.31 | 39.92 | 80.76 | 0.1287 | 0.1244 | 35.26 | 15 |
| 094 | 35.84 | 64.79 | 49.36 | 100.82 | 27.50 | 50.74 | 30.88 | 73.53 | 0.0867 | 0.0825 | 0.30 | 9 |
| 095 | 38.40 | 64.23 | 52.95 | 105.11 | 27.99 | 54.61 | 30.65 | 77.40 | 0.0576 | 0.0560 | 18.90 | 22 |
| 096 | 36.23 | 57.67 | 41.59 | 90.89 | 27.24 | 49.73 | 27.39 | 70.26 | 0.0672 | 0.0664 | 5.87 | 11 |
| 097 | 47.68 | 109.36 | 71.30 | 157.14 | 35.49 | 93.52 | 47.17 | 125.55 | 0.1453 | 0.1652 | 50.81 | 82 |
| 098 | 63.04 | 111.60 | 57.64 | 160.10 | 40.80 | 113.81 | 43.25 | 142.25 | 0.1440 | 0.1211 | 60.44 | 74 |
| 099 | 42.39 | 62.90 | 55.69 | 108.12 | 28.51 | 55.08 | 47.73 | 89.48 | 0.1249 | 0.1250 | 57.08 | 10 |
| 100 | 37.77 | 58.21 | 38.68 | 89.88 | 25.34 | 48.11 | 22.69 | 65.69 | 0.0717 | 0.0766 | 15.93 | 14 |
| 101 | 38.02 | 68.61 | 48.13 | 103.72 | 24.48 | 52.00 | 26.68 | 70.49 | 0.1049 | 0.1063 | 55.10 | 19 |
| 102 | 35.14 | 54.34 | 35.82 | 84.05 | 24.12 | 44.96 | 19.36 | 60.51 | 0.0604 | 0.0561 | 23.58 | 9 |
| 103 | 33.13 | 52.02 | 27.08 | 76.04 | 23.15 | 43.18 | 18.57 | 58.62 | 0.0376 | 0.0327 | 19.17 | 7 |
| 104 | 34.16 | 52.39 | 27.53 | 77.56 | 24.13 | 43.42 | 18.74 | 59.23 | 0.0252 | 0.0167 | 16.75 | 6 |
| 105 | 34.76 | 46.85 | 23.23 | 71.21 | 27.80 | 43.02 | 16.42 | 59.90 | 0.0356 | 0.0359 | 1.38 | 2 |
| 106 | 35.79 | 53.18 | 28.06 | 80.61 | 29.87 | 46.64 | 18.30 | 65.88 | 0.0582 | 0.0591 | 2.22 | 6 |
| 107 | 41.94 | 74.37 | 50.23 | 113.39 | 32.92 | 54.75 | 25.15 | 77.70 | 0.0524 | 0.0477 | 61.65 | 22 |
| 108 | 39.38 | 52.72 | 51.33 | 94.81 | 32.06 | 43.91 | 46.26 | 80.67 | 0.0564 | 0.0661 | 32.89 | 12 |
| 109 | 37.09 | 48.67 | 25.87 | 76.37 | 30.27 | 43.70 | 17.61 | 63.20 | 0.0462 | 0.0486 | 8.52 | 6 |
| 110 | 37.09 | 58.03 | 38.25 | 92.21 | 31.76 | 44.77 | 18.69 | 66.19 | 0.0250 | 0.0267 | 18.95 | 12 |
| 111 | 32.58 | 51.83 | 57.85 | 94.42 | 24.88 | 42.85 | 47.88 | 76.71 | 0.0609 | 0.0693 | 22.67 | 13 |
| 112 | 30.63 | 47.93 | 26.99 | 71.46 | 22.53 | 41.69 | 17.04 | 55.83 | 0.0244 | 0.0233 | 0.35 | 10 |
| 113 | 29.79 | 49.26 | 54.51 | 88.44 | 22.25 | 41.38 | 48.12 | 74.18 | 0.0401 | 0.0513 | 5.68 | 5 |
| 114 | 30.25 | 47.02 | 27.53 | 71.38 | 23.19 | 40.79 | 17.18 | 56.02 | 0.0071 | 0.0092 | 4.85 | 6 |
| 115 | 34.64 | 59.11 | 36.31 | 89.64 | 25.29 | 47.55 | 18.69 | 64.14 | 0.0447 | 0.0467 | 21.20 | 21 |
| 116 | 36.37 | 47.79 | 46.69 | 86.28 | 28.14 | 44.62 | 45.08 | 78.14 | 0.0518 | 0.0624 | 21.24 | 5 |
| 117 | 36.05 | 48.64 | 21.52 | 73.43 | 29.64 | 43.83 | 16.18 | 62.56 | 0.0548 | 0.0585 | 5.62 | 2 |
| 118 | 35.36 | 58.43 | 34.29 | 88.70 | 30.15 | 47.81 | 18.20 | 67.32 | 0.0283 | 0.0302 | 5.68 | 13 |
| 119 | 31.29 | 58.65 | 58.80 | 100.82 | 22.26 | 44.59 | 46.26 | 76.60 | 0.0519 | 0.0602 | 10.54 | 14 |
| 120 | 30.71 | 53.68 | 31.25 | 78.67 | 22.94 | 43.85 | 17.71 | 58.10 | 0.0160 | 0.0161 | 6.34 | 12 |
| 121 | 32.22 | 52.22 | 31.30 | 79.22 | 24.44 | 42.98 | 17.05 | 58.33 | 0.0225 | 0.0252 | 3.56 | 12 |
| 122 | 31.03 | 63.16 | 37.51 | 90.30 | 22.80 | 46.29 | 18.40 | 60.55 | 0.0745 | 0.0941 | 48.29 | 15 |
| 123 | 31.97 | 67.67 | 66.57 | 113.91 | 23.10 | 47.64 | 47.42 | 80.31 | 0.0561 | 0.0578 | 18.33 | 21 |
| 124 | 31.99 | 55.37 | 34.31 | 82.60 | 23.41 | 43.98 | 19.76 | 59.64 | 0.0289 | 0.0290 | 1.32 | 17 |
| 125 | 30.43 | 50.20 | 31.34 | 75.17 | 22.34 | 41.52 | 19.56 | 56.48 | 0.0184 | 0.0149 | 3.38 | 6 |
| 126 | 31.10 | 54.26 | 34.45 | 80.77 | 24.07 | 42.12 | 19.75 | 58.07 | 0.0478 | 0.0449 | 6.52 | 10 |
| 127 | 30.71 | 57.33 | 37.75 | 84.80 | 23.34 | 41.92 | 20.31 | 57.62 | 0.0652 | 0.0657 | 13.79 | 11 |
| 128 | 29.13 | 52.59 | 30.61 | 76.69 | 21.93 | 41.81 | 20.12 | 57.31 | 0.0275 | 0.0314 | 5.14 | 5 |
| 129 | 27.48 | 47.13 | 24.23 | 67.07 | 22.60 | 41.91 | 16.63 | 55.96 | 0.0214 | 0.0251 | 19.37 | 4 |
| 130 | 28.05 | 54.47 | 34.44 | 80.17 | 22.04 | 43.49 | 17.36 | 57.47 | 0.0103 | 0.0099 | 6.18 | 8 |
| 131 | 29.93 | 53.60 | 33.82 | 79.88 | 23.35 | 42.16 | 17.70 | 57.08 | 0.0189 | 0.0233 | 6.24 | 6 |
| 132 | 29.01 | 53.87 | 51.99 | 90.14 | 23.15 | 42.28 | 45.36 | 73.16 | 0.0451 | 0.0514 | 11.40 | 4 |
| 133 | 28.44 | 60.74 | 48.81 | 94.35 | 21.17 | 44.43 | 22.28 | 59.93 | 0.0824 | 0.0868 | 39.54 | 15 |
| 134 | 27.64 | 53.08 | 36.49 | 80.47 | 20.82 | 43.11 | 19.51 | 57.53 | 0.0510 | 0.0626 | 4.18 | 14 |
| 135 | 28.75 | 51.78 | 39.87 | 82.10 | 22.99 | 41.89 | 23.56 | 60.38 | 0.0155 | 0.0182 | 1.65 | 9 |
| 136 | 42.08 | 75.91 | 97.91 | 145.74 | 41.84 | 59.20 | 70.31 | 113.66 | 0.1308 | 0.1348 | 8.95 | 12 |

| | | | | | | | | | | | | |
|-----|-------|--------|--------|--------|-------|--------|-------|--------|--------|--------|--------|-----|
| 137 | 30.25 | 62.87 | 50.27 | 99.04 | 24.83 | 45.35 | 26.08 | 66.08 | 0.0846 | 0.0811 | 10.30 | 16 |
| 138 | 35.29 | 67.40 | 42.68 | 99.26 | 22.03 | 55.19 | 25.40 | 71.92 | 0.1000 | 0.1048 | 60.68 | 28 |
| 139 | 29.89 | 52.33 | 28.40 | 75.57 | 21.87 | 43.27 | 16.16 | 56.14 | 0.0369 | 0.0405 | 13.55 | 7 |
| 140 | 30.45 | 48.21 | 28.34 | 72.59 | 23.41 | 40.91 | 16.42 | 55.31 | 0.0346 | 0.0352 | 1.26 | 7 |
| 141 | 30.27 | 50.25 | 34.98 | 77.43 | 24.64 | 43.39 | 22.10 | 60.76 | 0.0533 | 0.0610 | 20.28 | 4 |
| 142 | 27.77 | 50.91 | 31.94 | 75.42 | 21.10 | 42.76 | 19.00 | 57.00 | 0.0328 | 0.0399 | 11.13 | 5 |
| 143 | 29.64 | 53.13 | 77.26 | 109.57 | 24.16 | 42.89 | 67.25 | 91.87 | 0.1745 | 0.2002 | 44.82 | 8 |
| 144 | 31.61 | 57.29 | 71.09 | 108.16 | 26.83 | 46.91 | 58.77 | 88.65 | 0.1010 | 0.1175 | 1.93 | 29 |
| 145 | 44.11 | 104.34 | 88.38 | 162.65 | 29.80 | 82.33 | 52.10 | 114.11 | 0.1906 | 0.1649 | 110.55 | 93 |
| 146 | 39.82 | 75.98 | 61.83 | 120.63 | 28.28 | 55.91 | 29.67 | 78.40 | 0.0958 | 0.0771 | 47.04 | 28 |
| 147 | 34.72 | 60.34 | 49.20 | 97.42 | 25.18 | 45.83 | 24.90 | 65.43 | 0.1195 | 0.1110 | 39.38 | 15 |
| 148 | 34.48 | 53.22 | 42.72 | 87.07 | 27.37 | 43.06 | 26.59 | 64.66 | 0.0994 | 0.0886 | 5.70 | 8 |
| 149 | 33.69 | 53.55 | 46.26 | 89.65 | 26.07 | 43.70 | 27.16 | 65.11 | 0.1085 | 0.1024 | 14.81 | 9 |
| 150 | 33.13 | 60.26 | 52.50 | 99.26 | 25.75 | 46.07 | 27.14 | 67.02 | 0.0907 | 0.0822 | 6.15 | 24 |
| 151 | 32.61 | 68.45 | 71.42 | 118.08 | 25.01 | 48.68 | 52.59 | 85.69 | 0.1197 | 0.1183 | 8.91 | 22 |
| 152 | 29.69 | 51.75 | 27.52 | 74.02 | 21.18 | 41.91 | 16.66 | 54.75 | 0.0220 | 0.0228 | 19.14 | 10 |
| 153 | 28.72 | 53.31 | 28.39 | 75.45 | 21.74 | 41.33 | 16.73 | 54.75 | 0.0244 | 0.0257 | 16.02 | 8 |
| 154 | 27.82 | 49.26 | 52.18 | 86.75 | 21.81 | 41.06 | 46.88 | 73.60 | 0.0361 | 0.0404 | 2.07 | 6 |
| 155 | 28.57 | 57.48 | 59.82 | 98.48 | 21.81 | 42.59 | 47.24 | 75.29 | 0.0477 | 0.0509 | 10.07 | 11 |
| 156 | 29.24 | 50.44 | 29.11 | 73.84 | 22.57 | 42.15 | 17.92 | 56.57 | 0.0200 | 0.0225 | 6.52 | 12 |
| 157 | 29.17 | 67.63 | 48.58 | 100.80 | 20.85 | 45.49 | 22.85 | 61.53 | 0.0283 | 0.0366 | 15.99 | 24 |
| 158 | 27.22 | 53.13 | 31.75 | 76.94 | 21.10 | 42.29 | 17.99 | 56.09 | 0.0201 | 0.0312 | 6.41 | 15 |
| 159 | 27.67 | 52.50 | 33.14 | 77.59 | 21.20 | 42.37 | 18.31 | 56.15 | 0.0464 | 0.0537 | 4.82 | 11 |
| 160 | 35.40 | 77.56 | 82.02 | 134.23 | 25.77 | 54.58 | 51.94 | 90.24 | 0.0866 | 0.0865 | 5.85 | 64 |
| 161 | 33.05 | 48.84 | 27.00 | 73.04 | 24.42 | 44.80 | 20.27 | 60.72 | 0.0707 | 0.0723 | 10.21 | 5 |
| 162 | 32.45 | 65.17 | 53.57 | 104.30 | 23.91 | 50.78 | 22.36 | 67.47 | 0.1169 | 0.1228 | 28.70 | 21 |
| 163 | 31.59 | 61.49 | 112.03 | 145.60 | 23.77 | 46.90 | 98.94 | 122.50 | 0.1016 | 0.1225 | 5.82 | 25 |
| 164 | 31.57 | 53.50 | 30.94 | 79.10 | 23.90 | 44.65 | 19.42 | 60.15 | 0.0720 | 0.0782 | 9.24 | 15 |
| 165 | 28.42 | 53.81 | 34.89 | 80.00 | 21.61 | 41.98 | 17.55 | 55.81 | 0.0457 | 0.0471 | 5.09 | 10 |
| 166 | 27.58 | 58.71 | 59.86 | 98.71 | 21.83 | 44.84 | 47.60 | 76.07 | 0.0442 | 0.0517 | 6.09 | 29 |
| 167 | 28.63 | 55.45 | 62.30 | 99.43 | 21.89 | 44.23 | 47.59 | 76.83 | 0.0477 | 0.0649 | 25.51 | 23 |
| 168 | 28.19 | 46.89 | 25.88 | 67.95 | 21.08 | 41.46 | 18.09 | 54.76 | 0.0160 | 0.0228 | 15.74 | 5 |
| 169 | 27.84 | 46.88 | 27.62 | 69.05 | 22.95 | 41.12 | 18.85 | 56.19 | 0.0306 | 0.0321 | 4.86 | 6 |
| 170 | 31.60 | 50.02 | 33.62 | 77.65 | 27.07 | 43.91 | 19.58 | 61.31 | 0.0700 | 0.0776 | 12.47 | 10 |
| 171 | 30.13 | 50.70 | 28.39 | 74.27 | 25.06 | 42.36 | 19.26 | 59.26 | 0.0527 | 0.0584 | 1.65 | 6 |
| 172 | 26.91 | 48.70 | 31.07 | 72.62 | 21.22 | 40.31 | 18.22 | 54.55 | 0.0250 | 0.0269 | 1.44 | 6 |
| 173 | 26.15 | 48.06 | 31.07 | 71.66 | 20.92 | 42.34 | 19.33 | 56.63 | 0.0058 | 0.0108 | 1.82 | 6 |
| 174 | 26.23 | 52.39 | 53.85 | 88.40 | 21.72 | 41.76 | 47.31 | 73.10 | 0.0668 | 0.0847 | 12.47 | 11 |
| 175 | 28.29 | 63.99 | 45.39 | 95.43 | 23.14 | 47.14 | 21.58 | 62.81 | 0.0237 | 0.0330 | 16.90 | 27 |
| 176 | 28.95 | 54.38 | 33.17 | 79.45 | 21.47 | 42.43 | 19.02 | 56.87 | 0.0336 | 0.0317 | 25.89 | 15 |
| 177 | 27.61 | 47.13 | 26.19 | 68.51 | 21.85 | 40.90 | 16.99 | 54.59 | 0.0148 | 0.0097 | 9.30 | 6 |
| 178 | 33.65 | 87.78 | 79.87 | 139.05 | 24.30 | 56.70 | 49.79 | 89.27 | 0.1095 | 0.1087 | 20.51 | 40 |
| 179 | 30.94 | 57.47 | 48.76 | 92.09 | 21.81 | 45.07 | 31.45 | 65.66 | 0.0660 | 0.0728 | 26.65 | 18 |
| 180 | 32.41 | 56.90 | 71.83 | 110.48 | 24.63 | 44.24 | 55.56 | 84.97 | 0.1535 | 0.1455 | 38.08 | 10 |
| 181 | 34.88 | 61.92 | 61.51 | 107.69 | 26.98 | 45.33 | 35.46 | 71.64 | 0.1264 | 0.1188 | 29.41 | 8 |
| 182 | 30.95 | 50.13 | 46.40 | 86.20 | 24.83 | 42.45 | 29.50 | 64.74 | 0.0767 | 0.0664 | 17.47 | 4 |
| 183 | 27.15 | 51.99 | 28.41 | 73.29 | 21.24 | 41.10 | 17.93 | 54.91 | 0.0211 | 0.0295 | 3.67 | 7 |
| 184 | 27.04 | 46.63 | 22.90 | 65.42 | 22.70 | 40.83 | 16.12 | 54.46 | 0.0043 | 0.0096 | 13.98 | 4 |
| 185 | 26.50 | 52.41 | 31.81 | 75.62 | 22.48 | 41.37 | 18.91 | 56.57 | 0.0165 | 0.0215 | 4.71 | 8 |
| 186 | 26.44 | 55.26 | 31.35 | 77.95 | 21.80 | 43.19 | 19.09 | 57.76 | 0.0058 | 0.0112 | 0.20 | 8 |
| 187 | 26.48 | 55.60 | 34.03 | 80.55 | 21.49 | 42.24 | 17.06 | 55.95 | 0.0090 | 0.0147 | 7.15 | 9 |
| 188 | 27.16 | 47.43 | 32.65 | 72.81 | 22.45 | 40.68 | 19.04 | 56.24 | 0.0130 | 0.0126 | 6.91 | 5 |
| 189 | 26.44 | 47.79 | 26.53 | 68.38 | 21.59 | 39.45 | 16.28 | 52.73 | 0.0257 | 0.0338 | 0.10 | 5 |
| 190 | 26.65 | 47.71 | 30.90 | 71.71 | 21.74 | 41.45 | 17.74 | 55.21 | 0.0263 | 0.0309 | 1.53 | 6 |
| 191 | 28.21 | 49.23 | 30.12 | 72.67 | 24.36 | 41.57 | 18.29 | 57.16 | 0.0355 | 0.0359 | 7.03 | 6 |
| 192 | 27.87 | 58.28 | 39.36 | 86.72 | 24.46 | 42.16 | 19.45 | 59.00 | 0.0598 | 0.0678 | 2.38 | 20 |
| 193 | 27.81 | 68.06 | 55.45 | 106.31 | 23.00 | 49.06 | 21.90 | 65.38 | 0.0717 | 0.0793 | 15.79 | 34 |
| 194 | 28.52 | 51.07 | 30.69 | 74.76 | 22.69 | 45.07 | 20.64 | 60.22 | 0.0348 | 0.0546 | 6.38 | 9 |
| 195 | 29.46 | 59.44 | 68.12 | 107.77 | 22.57 | 44.97 | 48.60 | 79.29 | 0.0529 | 0.0565 | 5.92 | 42 |
| 196 | 30.57 | 68.20 | 50.50 | 103.39 | 23.05 | 48.02 | 23.20 | 64.46 | 0.0210 | 0.0339 | 21.84 | 51 |
| 197 | 53.43 | 130.92 | 95.92 | 194.28 | 34.16 | 101.06 | 54.71 | 135.75 | 0.1708 | 0.2134 | 105.28 | 164 |
| 198 | 58.48 | 118.67 | 57.64 | 166.69 | 39.11 | 120.14 | 39.53 | 145.41 | 0.1480 | 0.1281 | 49.71 | 50 |
| 199 | 48.70 | 60.59 | 26.67 | 92.88 | 39.22 | 60.30 | 21.36 | 82.86 | 0.1513 | 0.1475 | 21.19 | 8 |
| 200 | 41.40 | 59.14 | 30.90 | 88.31 | 34.80 | 49.72 | 19.16 | 70.07 | 0.1076 | 0.1080 | 19.79 | 12 |
| 201 | 38.84 | 58.38 | 33.19 | 88.26 | 33.04 | 48.81 | 22.09 | 70.26 | 0.0952 | 0.0978 | 8.95 | 14 |
| 202 | 42.59 | 88.56 | 60.98 | 131.08 | 31.73 | 69.04 | 32.36 | 91.62 | 0.1905 | 0.1865 | 62.14 | 36 |
| 203 | 35.10 | 51.11 | 30.49 | 78.67 | 23.74 | 41.78 | 19.14 | 62.60 | 0.0563 | 0.0595 | 19.75 | 7 |
| 204 | 34.25 | 64.98 | 44.96 | 99.81 | 24.08 | 51.55 | 19.95 | 67.23 | 0.0614 | 0.0590 | 18.94 | 12 |
| 205 | 33.11 | 64.71 | 39.95 | 94.50 | 23.76 | 51.57 | 22.41 | 67.60 | 0.0495 | 0.0520 | 4.29 | 23 |
| 206 | 33.90 | 56.56 | 33.23 | 84.18 | 24.65 | 47.67 | 21.41 | 64.09 | 0.0413 | 0.0392 | 18.17 | 5 |
| 207 | 32.22 | 51.95 | 28.03 | 76.04 | 24.12 | 43.56 | 17.80 | 58.27 | 0.0347 | 0.0349 | 21.15 | 5 |

| | | | | | | | | | | | | |
|-----|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|-----|
| 208 | 31.59 | 67.25 | 47.99 | 100.87 | 22.46 | 49.71 | 24.47 | 66.60 | 0.0700 | 0.0671 | 9.14 | 19 |
| 209 | 33.40 | 51.53 | 50.50 | 89.92 | 24.65 | 46.05 | 47.01 | 78.93 | 0.0773 | 0.0854 | 20.96 | 7 |
| 210 | 42.25 | 74.60 | 56.37 | 120.23 | 34.72 | 48.44 | 22.29 | 72.61 | 0.0068 | 0.0060 | 45.97 | 32 |
| 211 | 46.27 | 76.56 | 51.82 | 119.99 | 39.13 | 53.30 | 26.80 | 81.01 | 0.0420 | 0.0285 | 70.26 | 27 |
| 212 | 36.02 | 50.98 | 29.59 | 78.05 | 27.35 | 42.54 | 19.71 | 59.92 | 0.0063 | 0.0052 | 25.02 | 8 |
| 213 | 34.31 | 61.16 | 42.72 | 93.75 | 26.45 | 45.77 | 22.09 | 63.67 | 0.0273 | 0.0216 | 3.54 | 21 |
| 214 | 33.11 | 55.81 | 40.26 | 87.85 | 24.17 | 45.65 | 19.92 | 61.84 | 0.0413 | 0.0469 | 21.75 | 12 |
| 215 | 33.10 | 57.26 | 36.00 | 85.94 | 24.03 | 43.95 | 18.87 | 59.42 | 0.0357 | 0.0381 | 34.13 | 10 |
| 216 | 32.71 | 50.32 | 31.82 | 77.73 | 24.79 | 40.99 | 17.23 | 56.60 | 0.0099 | 0.0085 | 20.13 | 9 |
| 217 | 36.77 | 59.37 | 40.11 | 93.27 | 29.83 | 46.14 | 19.12 | 65.61 | 0.0126 | 0.0172 | 37.32 | 17 |
| 218 | 38.36 | 59.72 | 46.13 | 99.29 | 32.08 | 47.40 | 22.91 | 71.20 | 0.0240 | 0.0232 | 31.60 | 25 |
| 219 | 32.43 | 60.01 | 39.61 | 89.46 | 21.96 | 46.18 | 22.00 | 61.41 | 0.0621 | 0.0653 | 32.94 | 16 |
| 220 | 31.16 | 49.01 | 30.04 | 74.57 | 22.32 | 42.12 | 17.57 | 55.97 | 0.0230 | 0.0197 | 2.61 | 7 |
| 221 | 30.28 | 47.98 | 28.47 | 71.48 | 22.28 | 41.93 | 17.93 | 55.72 | 0.0422 | 0.0489 | 2.85 | 6 |
| 222 | 31.05 | 47.46 | 27.67 | 71.40 | 22.50 | 42.00 | 18.19 | 56.28 | 0.0365 | 0.0412 | 8.99 | 5 |
| 223 | 32.27 | 64.99 | 52.66 | 102.72 | 23.03 | 49.31 | 23.89 | 66.75 | 0.0697 | 0.0737 | 35.43 | 25 |
| 224 | 44.46 | 95.35 | 71.58 | 147.38 | 26.30 | 71.39 | 32.71 | 92.94 | 0.1389 | 0.1433 | 77.61 | 17 |
| 225 | 56.67 | 140.22 | 116.83 | 219.16 | 37.04 | 117.76 | 63.54 | 155.89 | 0.2822 | 0.2830 | 117.19 | 123 |
| 226 | 40.29 | 56.05 | 29.80 | 86.10 | 27.39 | 51.43 | 20.90 | 69.27 | 0.0807 | 0.0727 | 24.45 | 19 |
| 227 | 36.84 | 51.19 | 50.82 | 93.11 | 26.25 | 47.96 | 46.14 | 81.08 | 0.0786 | 0.0782 | 19.82 | 12 |
| 228 | 40.27 | 52.09 | 28.63 | 81.53 | 31.92 | 45.10 | 17.16 | 64.38 | 0.1155 | 0.1206 | 9.11 | 8 |
| 229 | 39.16 | 51.31 | 30.47 | 81.09 | 31.89 | 45.30 | 17.59 | 64.47 | 0.0947 | 0.0978 | 6.26 | 7 |
| 230 | 37.79 | 49.20 | 42.33 | 86.62 | 29.34 | 42.45 | 35.72 | 72.22 | 0.1026 | 0.0963 | 30.04 | 6 |
| 231 | 34.46 | 40.10 | 40.55 | 75.70 | 25.65 | 37.91 | 30.37 | 61.89 | 0.0729 | 0.0667 | 0.13 | 3 |
| 232 | 33.94 | 41.80 | 43.36 | 77.94 | 25.82 | 37.98 | 32.64 | 62.99 | 0.0723 | 0.0692 | 3.99 | 4 |
| 233 | 33.87 | 40.83 | 45.16 | 78.44 | 25.88 | 37.56 | 34.39 | 63.69 | 0.0788 | 0.0744 | 6.35 | 4 |
| 234 | 33.60 | 56.15 | 53.34 | 97.11 | 25.26 | 43.59 | 26.21 | 64.50 | 0.0845 | 0.0766 | 14.69 | 10 |
| 235 | 32.67 | 46.01 | 20.55 | 67.24 | 23.86 | 41.34 | 16.11 | 55.64 | 0.0316 | 0.0323 | 7.50 | 2 |
| 236 | 32.76 | 49.76 | 54.62 | 91.96 | 24.60 | 42.87 | 46.12 | 76.45 | 0.0590 | 0.0696 | 25.80 | 7 |
| 237 | 32.12 | 50.09 | 26.54 | 73.90 | 24.06 | 41.14 | 17.06 | 56.45 | 0.0203 | 0.0208 | 23.14 | 8 |
| 238 | 31.61 | 46.44 | 21.88 | 68.04 | 23.76 | 41.89 | 15.64 | 55.87 | 0.0221 | 0.0223 | 1.44 | 3 |
| 239 | 31.56 | 48.64 | 26.92 | 72.72 | 23.52 | 41.18 | 16.49 | 55.95 | 0.0376 | 0.0388 | 17.35 | 5 |
| 240 | 31.08 | 46.05 | 24.34 | 68.88 | 24.18 | 40.72 | 16.26 | 55.51 | 0.0114 | 0.0132 | 8.19 | 7 |
| 241 | 32.77 | 54.32 | 42.09 | 87.90 | 24.36 | 44.52 | 21.90 | 62.51 | 0.0157 | 0.0160 | 13.40 | 27 |
| 242 | 36.79 | 69.28 | 50.57 | 105.70 | 25.19 | 49.50 | 25.70 | 68.58 | 0.0951 | 0.1038 | 31.51 | 35 |
| 243 | 35.38 | 48.68 | 31.97 | 77.84 | 25.20 | 42.88 | 18.30 | 59.02 | 0.0370 | 0.0394 | 7.03 | 12 |
| 244 | 34.13 | 52.89 | 35.52 | 82.60 | 24.47 | 43.98 | 19.22 | 59.97 | 0.0397 | 0.0442 | 10.47 | 14 |
| 245 | 34.87 | 54.44 | 32.99 | 83.20 | 25.45 | 44.96 | 17.95 | 61.12 | 0.0072 | 0.0156 | 13.68 | 16 |
| 246 | 37.84 | 72.13 | 49.26 | 109.26 | 26.93 | 51.89 | 22.82 | 70.16 | 0.0587 | 0.0631 | 46.18 | 23 |
| 247 | 33.68 | 45.57 | 24.12 | 69.98 | 24.31 | 41.14 | 18.06 | 56.75 | 0.0180 | 0.0188 | 10.57 | 7 |
| 248 | 37.51 | 54.71 | 34.89 | 86.23 | 28.19 | 48.18 | 23.04 | 67.70 | 0.0370 | 0.0348 | 8.74 | 18 |
| 249 | 34.48 | 49.23 | 58.37 | 96.24 | 25.29 | 45.46 | 49.53 | 82.12 | 0.1158 | 0.1182 | 47.52 | 7 |
| 250 | 34.92 | 46.25 | 42.88 | 82.66 | 27.26 | 41.84 | 27.80 | 64.79 | 0.1273 | 0.1322 | 0.98 | 12 |
| 251 | 36.28 | 57.95 | 58.21 | 102.61 | 26.23 | 43.82 | 30.38 | 67.59 | 0.1352 | 0.1426 | 36.41 | 15 |
| 252 | 35.10 | 54.00 | 49.32 | 93.40 | 25.50 | 44.69 | 23.75 | 64.12 | 0.0498 | 0.0432 | 17.75 | 17 |
| 253 | 33.36 | 46.55 | 20.83 | 68.36 | 24.42 | 42.01 | 15.97 | 56.55 | 0.0014 | 0.0026 | 3.78 | 5 |
| 254 | 32.50 | 45.08 | 21.51 | 67.06 | 24.68 | 41.49 | 15.81 | 56.13 | 0.0059 | 0.0072 | 0.08 | 4 |
| 255 | 31.10 | 45.60 | 22.41 | 67.48 | 24.12 | 42.14 | 16.06 | 56.57 | 0.0064 | 0.0042 | 8.18 | 4 |
| 256 | 34.87 | 64.03 | 45.75 | 98.68 | 25.14 | 52.72 | 22.70 | 70.56 | 0.0863 | 0.0838 | 0.89 | 21 |
| 257 | 38.33 | 53.70 | 30.69 | 81.83 | 28.96 | 45.20 | 20.17 | 63.45 | 0.0858 | 0.0866 | 20.57 | 10 |
| 258 | 35.89 | 50.29 | 27.38 | 76.28 | 27.20 | 43.88 | 17.02 | 59.86 | 0.0713 | 0.0743 | 8.91 | 4 |
| 259 | 31.43 | 49.38 | 26.55 | 73.41 | 24.32 | 43.49 | 17.12 | 58.48 | 0.0017 | 0.0041 | 6.13 | 12 |
| 260 | 34.01 | 60.61 | 46.49 | 95.93 | 24.15 | 48.99 | 24.48 | 67.42 | 0.0355 | 0.0337 | 2.91 | 29 |
| 261 | 41.62 | 85.35 | 56.80 | 125.15 | 28.52 | 68.64 | 36.00 | 92.34 | 0.0511 | 0.0675 | 7.40 | 56 |
| 262 | 50.44 | 85.82 | 51.00 | 129.42 | 32.61 | 83.89 | 32.21 | 106.83 | 0.0679 | 0.0413 | 21.78 | 70 |
| 263 | 41.70 | 66.77 | 42.04 | 102.10 | 26.66 | 55.72 | 25.08 | 75.15 | 0.0837 | 0.0773 | 21.54 | 30 |
| 264 | 39.45 | 51.58 | 28.59 | 80.81 | 26.87 | 46.20 | 18.48 | 62.98 | 0.0618 | 0.0631 | 24.14 | 12 |
| 265 | 38.80 | 51.71 | 29.32 | 80.31 | 28.31 | 44.58 | 17.96 | 61.60 | 0.0776 | 0.0772 | 13.86 | 9 |
| 266 | 36.47 | 48.90 | 26.07 | 74.51 | 26.46 | 42.67 | 18.76 | 59.52 | 0.0544 | 0.0535 | 8.71 | 6 |
| 267 | 35.26 | 46.66 | 25.82 | 72.79 | 24.82 | 41.70 | 17.58 | 57.61 | 0.0387 | 0.0336 | 13.12 | 7 |
| 268 | 34.84 | 50.11 | 30.77 | 78.35 | 25.44 | 43.43 | 19.84 | 60.39 | 0.0044 | 0.0086 | 6.43 | 12 |
| 269 | 37.58 | 61.29 | 44.43 | 97.22 | 26.39 | 48.34 | 23.92 | 67.51 | 0.0413 | 0.0444 | 18.30 | 19 |
| 270 | 38.61 | 62.80 | 48.38 | 100.74 | 25.71 | 50.23 | 24.93 | 68.93 | 0.0798 | 0.0809 | 23.06 | 24 |
| 271 | 36.22 | 53.59 | 32.26 | 82.04 | 25.58 | 45.32 | 20.79 | 62.11 | 0.0670 | 0.0726 | 28.34 | 11 |
| 272 | 36.97 | 51.16 | 37.62 | 84.18 | 25.91 | 44.08 | 20.72 | 61.63 | 0.0865 | 0.0884 | 13.51 | 12 |
| 273 | 37.78 | 49.15 | 28.84 | 77.35 | 28.48 | 43.84 | 19.31 | 61.77 | 0.0707 | 0.0707 | 0.35 | 7 |
| 274 | 42.13 | 83.84 | 62.48 | 127.03 | 27.56 | 60.78 | 31.89 | 82.88 | 0.1540 | 0.1615 | 36.01 | 51 |
| 275 | 39.60 | 51.96 | 29.55 | 81.12 | 27.11 | 45.64 | 19.12 | 62.79 | 0.0695 | 0.0655 | 20.20 | 13 |
| 276 | 36.93 | 55.88 | 37.63 | 87.67 | 26.22 | 45.41 | 21.79 | 63.87 | 0.0701 | 0.0666 | 6.79 | 10 |
| 277 | 112.76 | 140.72 | 76.48 | 235.74 | 120.15 | 109.22 | 49.02 | 201.01 | 0.7477 | 0.6013 | 10.86 | 30 |
| 278 | 49.26 | 96.83 | 69.78 | 147.66 | 32.76 | 83.31 | 42.42 | 112.65 | 0.1961 | 0.1824 | 24.11 | 63 |

| | | | | | | | | | | | | |
|-----|-------|--------|-------|--------|-------|--------|-------|--------|--------|--------|-------|-----|
| 279 | 67.60 | 122.17 | 85.33 | 184.09 | 43.93 | 112.95 | 51.72 | 145.25 | 0.3482 | 0.3474 | 80.25 | 116 |
| 280 | 49.04 | 54.88 | 23.17 | 87.83 | 33.42 | 56.63 | 20.00 | 76.58 | 0.1047 | 0.0951 | 19.60 | 4 |
| 281 | 41.04 | 53.63 | 26.45 | 81.56 | 28.71 | 47.19 | 19.07 | 65.04 | 0.0895 | 0.0852 | 17.87 | 4 |
| 282 | 38.18 | 46.35 | 23.10 | 72.63 | 26.74 | 42.44 | 18.52 | 59.56 | 0.0593 | 0.0576 | 11.47 | 2 |
| 283 | 35.55 | 46.77 | 26.80 | 73.59 | 25.38 | 41.68 | 18.65 | 58.17 | 0.0409 | 0.0372 | 3.11 | 4 |
| 284 | 35.15 | 55.45 | 37.38 | 85.35 | 24.45 | 44.59 | 20.02 | 60.42 | 0.0644 | 0.0573 | 25.61 | 8 |
| 285 | 36.51 | 59.60 | 42.25 | 92.46 | 25.16 | 45.47 | 22.61 | 63.41 | 0.0634 | 0.0621 | 42.32 | 15 |
| 286 | 35.63 | 47.35 | 27.26 | 74.11 | 25.54 | 42.33 | 19.51 | 59.09 | 0.0601 | 0.0601 | 14.35 | 6 |
| 287 | 37.78 | 63.08 | 63.42 | 111.12 | 24.64 | 50.32 | 45.20 | 82.36 | 0.0982 | 0.1000 | 41.14 | 36 |
| 288 | 45.31 | 86.38 | 77.63 | 142.23 | 28.50 | 71.83 | 49.19 | 104.75 | 0.1741 | 0.1656 | 72.70 | 45 |
| 289 | 38.53 | 53.25 | 28.34 | 81.47 | 26.05 | 46.77 | 17.86 | 62.45 | 0.0348 | 0.0345 | 12.91 | 8 |
| 290 | 37.38 | 52.00 | 29.87 | 80.22 | 25.17 | 44.67 | 18.19 | 60.58 | 0.0495 | 0.0588 | 17.18 | 10 |
| 291 | 35.31 | 50.58 | 30.27 | 78.33 | 25.02 | 42.51 | 19.59 | 59.34 | 0.0649 | 0.0676 | 11.25 | 11 |
| 292 | 37.79 | 53.95 | 32.02 | 82.69 | 28.96 | 44.23 | 20.03 | 63.22 | 0.0770 | 0.0799 | 6.99 | 9 |
| 293 | 35.85 | 52.22 | 25.76 | 77.99 | 26.65 | 43.67 | 16.47 | 59.90 | 0.0585 | 0.0558 | 6.76 | 9 |
| 294 | 32.85 | 46.87 | 42.26 | 80.59 | 24.22 | 42.21 | 41.99 | 71.94 | 0.0322 | 0.0384 | 13.48 | 3 |
| 295 | 32.60 | 46.99 | 41.41 | 79.97 | 25.11 | 42.41 | 40.58 | 71.42 | 0.0131 | 0.0153 | 11.22 | 3 |
| 296 | 35.61 | 55.93 | 39.59 | 88.61 | 27.33 | 45.97 | 22.44 | 65.21 | 0.0614 | 0.0692 | 10.15 | 16 |
| 297 | 36.67 | 52.84 | 35.85 | 84.13 | 25.34 | 45.29 | 22.02 | 62.76 | 0.0532 | 0.0495 | 22.98 | 15 |
| 298 | 36.52 | 54.09 | 35.09 | 84.71 | 26.23 | 45.76 | 21.90 | 63.70 | 0.0768 | 0.0740 | 21.80 | 9 |
| 299 | 35.55 | 53.01 | 50.15 | 91.90 | 26.28 | 45.01 | 42.02 | 75.65 | 0.0810 | 0.0832 | 13.84 | 6 |
| 300 | 35.24 | 58.70 | 35.52 | 87.45 | 25.31 | 45.98 | 21.42 | 63.01 | 0.0928 | 0.0933 | 34.84 | 8 |
| 301 | 46.23 | 72.38 | 38.59 | 108.20 | 41.37 | 64.70 | 30.76 | 94.78 | 0.0515 | 0.0648 | 84.71 | 4 |
| 302 | 35.20 | 60.80 | 45.40 | 96.40 | 28.51 | 50.91 | 27.27 | 72.79 | 0.0671 | 0.0694 | 10.27 | 20 |
| 303 | 44.98 | 90.84 | 71.86 | 140.47 | 29.03 | 74.95 | 37.88 | 98.94 | 0.1679 | 0.1560 | 44.83 | 34 |
| 304 | 37.96 | 62.36 | 44.07 | 97.47 | 27.34 | 51.57 | 25.99 | 71.26 | 0.0527 | 0.0559 | 10.53 | 15 |

APPENDIX C. DIFFERENCING OF EARLY AND LATE CALIBRATION RESULTS

The columns of data below give the difference between the data columns in APPENDIX A and APPENDIX B, except for the first and last columns (day of year and Ap of day) which are the same and undifferenced. Sign convention is Late Calibration Results minus Early Calibration Results (APPENDIX H).

| | | | | | | | | | | | | |
|----|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|--------|----|
| 5 | -2.92 | 1.20 | 3.41 | 2.11 | -2.33 | 0.56 | 2.39 | 1.20 | 0.0217 | 0.0239 | -11.58 | 19 |
| 6 | -1.79 | -0.22 | -1.30 | -2.03 | -0.77 | -0.65 | -3.39 | -3.17 | -0.0125 | -0.0142 | -11.69 | 19 |
| 7 | -0.05 | -0.83 | -1.28 | -1.67 | 1.75 | -1.15 | -3.77 | -2.06 | -0.0199 | -0.0227 | -11.69 | 10 |
| 8 | -0.65 | 0.89 | 0.45 | 0.05 | 0.80 | 0.08 | 0.59 | 0.30 | 0.0223 | 0.0240 | -11.59 | 5 |
| 9 | -4.16 | 1.16 | 1.01 | -0.20 | -3.81 | 0.57 | 1.12 | 0.04 | -0.0043 | -0.0103 | 11.72 | 3 |
| 10 | -3.97 | 1.87 | -0.70 | -0.97 | -3.59 | 0.99 | -0.82 | -1.34 | 0.0224 | 0.0236 | -11.63 | 6 |
| 11 | -3.69 | 0.58 | -0.62 | -2.33 | -3.26 | -0.03 | -2.26 | -3.62 | -0.0205 | -0.0234 | 11.73 | 24 |
| 12 | -5.05 | 0.48 | -0.85 | -2.97 | -5.08 | -0.23 | -0.27 | -3.07 | -0.0006 | -0.0035 | -0.93 | 10 |
| 13 | -3.22 | 0.41 | -1.83 | -2.82 | -2.85 | -0.21 | -2.25 | -3.35 | -0.0157 | -0.0191 | -11.73 | 9 |
| 14 | -1.18 | 0.33 | 0.79 | 0.32 | 0.73 | -0.07 | 0.42 | 0.69 | 0.0193 | 0.0226 | -11.65 | 8 |
| 15 | -0.43 | 0.91 | -0.91 | -0.15 | 1.54 | 0.11 | -0.80 | 0.26 | 0.0194 | 0.0224 | -11.61 | 6 |
| 16 | -2.75 | 1.20 | 0.51 | 0.03 | -1.96 | 0.48 | 1.19 | 0.50 | 0.0223 | 0.0230 | -11.65 | 6 |
| 17 | -2.25 | 1.16 | -0.78 | -0.73 | -1.83 | 0.42 | 0.29 | -0.24 | 0.0214 | 0.0192 | -7.06 | 3 |
| 18 | -4.21 | 1.51 | 0.90 | -0.25 | -4.04 | 0.85 | 1.28 | -0.23 | -0.0010 | 0.0084 | -11.66 | 3 |
| 19 | -4.59 | 1.74 | 1.15 | -0.88 | -4.49 | 0.93 | 1.39 | -1.21 | -0.0136 | -0.0133 | 5.15 | 5 |
| 20 | -4.20 | 1.33 | 2.59 | -0.24 | -4.10 | 0.54 | 2.16 | -0.84 | 0.0013 | 0.0066 | -11.68 | 10 |
| 21 | -4.37 | 1.73 | 0.81 | -0.47 | -4.36 | 0.69 | 1.20 | -0.67 | 0.0190 | 0.0231 | -11.65 | 2 |
| 22 | -3.74 | 0.85 | 3.24 | 0.37 | -3.49 | 0.42 | 0.47 | -1.47 | -0.0029 | 0.0177 | 11.69 | 22 |
| 23 | -5.40 | 0.74 | 2.02 | -1.37 | -5.41 | -0.34 | 0.00 | -3.40 | -0.0069 | -0.0074 | -11.03 | 29 |
| 24 | -2.78 | 0.41 | 3.12 | -0.53 | -2.46 | -0.47 | 3.00 | -0.92 | -0.0139 | -0.0168 | -11.68 | 13 |
| 25 | -2.65 | 0.26 | 1.87 | -1.02 | -2.26 | -0.44 | 0.85 | -1.93 | -0.0116 | -0.0118 | -11.69 | 7 |
| 26 | -2.87 | 0.99 | 1.54 | -0.70 | -2.37 | 0.09 | 1.52 | -1.14 | -0.0152 | -0.0157 | -11.68 | 8 |
| 27 | -2.88 | 1.55 | 1.80 | 0.68 | -2.11 | 1.36 | -0.29 | 0.19 | 0.0013 | 0.0122 | 11.66 | 17 |
| 28 | -2.95 | -0.07 | -1.70 | -2.46 | -2.42 | -0.47 | -5.93 | -4.83 | -0.0143 | -0.0147 | -11.70 | 32 |
| 29 | -2.87 | -0.27 | -1.33 | -2.34 | -2.35 | -0.57 | -5.66 | -4.69 | -0.0128 | -0.0138 | -11.69 | 30 |
| 30 | -3.34 | 0.63 | 3.29 | -0.26 | -2.98 | 0.03 | 1.82 | -1.37 | -0.0047 | -0.0014 | -11.65 | 15 |
| 31 | -4.02 | 1.18 | 1.48 | -0.13 | -3.81 | 0.30 | 1.03 | -0.91 | 0.0151 | 0.0206 | -11.66 | 10 |
| 32 | -4.20 | 1.61 | 2.50 | 0.02 | -4.00 | 0.57 | 1.95 | -0.87 | 0.0134 | 0.0194 | 2.43 | 8 |
| 33 | -4.37 | 1.15 | 0.35 | -1.72 | -4.15 | 0.13 | -2.57 | -3.37 | -0.0108 | -0.0107 | 11.68 | 8 |
| 34 | -4.13 | 1.39 | 2.50 | -0.06 | -4.08 | 0.46 | 2.01 | -1.02 | 0.0052 | 0.0105 | 5.63 | 10 |
| 35 | -2.02 | 0.56 | -0.22 | -0.29 | -1.27 | -0.03 | -1.65 | -0.81 | -0.0210 | -0.0221 | 9.05 | 5 |
| 36 | -1.75 | 1.04 | 0.47 | 0.53 | -0.66 | 0.14 | -0.67 | -0.15 | -0.0156 | -0.0119 | 11.70 | 12 |
| 37 | -2.55 | 0.34 | 1.28 | 0.12 | -1.80 | -0.33 | -1.38 | -1.40 | -0.0158 | -0.0184 | -4.16 | 34 |
| 38 | -3.04 | -0.03 | 0.27 | -1.38 | -2.47 | -0.69 | -3.13 | -3.36 | -0.0146 | -0.0172 | -3.25 | 31 |
| 39 | -3.59 | 0.38 | 2.07 | -0.77 | -3.24 | -0.44 | -0.50 | -2.45 | -0.0135 | -0.0162 | 0.23 | 15 |
| 40 | -3.51 | 0.25 | 2.42 | -0.62 | -3.36 | -0.41 | -0.05 | -2.05 | -0.0009 | 0.0012 | -11.69 | 11 |
| 41 | -3.68 | 0.21 | 4.18 | 0.23 | -3.57 | -0.19 | 2.07 | -0.83 | -0.0005 | -0.0005 | 3.01 | 10 |
| 42 | -3.81 | 0.04 | 4.52 | 0.49 | -3.59 | -0.31 | 1.87 | -1.22 | -0.0108 | -0.0121 | 11.70 | 17 |
| 43 | -4.17 | -0.65 | 6.66 | 1.82 | -4.10 | -1.12 | 3.94 | -0.24 | -0.0062 | -0.0090 | -26.76 | 60 |
| 44 | -3.95 | -0.22 | 4.21 | -0.07 | -3.89 | -0.78 | 2.06 | -1.70 | 0.0113 | 0.0136 | -11.66 | 14 |
| 45 | -3.59 | -0.54 | 4.24 | 0.06 | -3.60 | -1.07 | 0.73 | -2.54 | -0.0019 | -0.0028 | 11.73 | 33 |
| 46 | -2.27 | -0.19 | 5.44 | 1.39 | -1.58 | -0.95 | 2.63 | -0.46 | -0.0204 | -0.0230 | 11.69 | 17 |
| 47 | -1.68 | -3.11 | 0.21 | -2.40 | -1.29 | -2.87 | 1.10 | -1.30 | -0.0173 | -0.0190 | 11.75 | 7 |
| 48 | -0.76 | -0.38 | 4.61 | 2.82 | 0.77 | -0.72 | 2.18 | 1.76 | 0.0190 | 0.0221 | -11.68 | 6 |
| 49 | -0.46 | 0.25 | 8.80 | 4.47 | 0.81 | -0.30 | 5.78 | 3.05 | 0.0188 | 0.0225 | -3.03 | 1 |
| 50 | -0.27 | 0.17 | 10.15 | 4.90 | 1.13 | -0.34 | 7.99 | 4.01 | 0.0222 | 0.0220 | -0.62 | 3 |
| 51 | -0.49 | 0.48 | 10.47 | 5.49 | 0.83 | 0.02 | 7.99 | 4.28 | 0.0007 | -0.0006 | 11.72 | 5 |
| 52 | -0.50 | 0.22 | 8.36 | 4.76 | 0.42 | 0.18 | 6.37 | 3.79 | -0.0093 | -0.0043 | 11.67 | 21 |
| 53 | -0.71 | 0.19 | 4.51 | 2.86 | 0.48 | -0.17 | 1.88 | 1.62 | -0.0066 | -0.0106 | 11.69 | 6 |
| 54 | 0.99 | -0.76 | -3.93 | -1.00 | 2.77 | 0.80 | -5.77 | -1.26 | -0.0079 | -0.0063 | 7.24 | 11 |
| 55 | 0.60 | -1.54 | -2.39 | -1.90 | 2.38 | -1.55 | -5.16 | -2.55 | -0.0174 | -0.0178 | -11.69 | 30 |
| 56 | -2.35 | -0.75 | -4.11 | -3.96 | -1.64 | -0.88 | -7.19 | -5.29 | 0.0023 | 0.0028 | -11.68 | 20 |
| 57 | -2.49 | -0.40 | 1.39 | -1.09 | -1.91 | -0.89 | 0.94 | -1.49 | 0.0152 | 0.0184 | -11.66 | 16 |
| 58 | -2.07 | -0.40 | -4.76 | -3.45 | -1.18 | -0.88 | -5.99 | -3.94 | -0.0164 | -0.0212 | 3.91 | 13 |
| 59 | -0.06 | -1.05 | -5.12 | -3.00 | 1.44 | -1.40 | -8.62 | -4.40 | -0.0213 | -0.0238 | -11.70 | 16 |

| | | | | | | | | | | | | |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|--------|----|
| 60 | -0.26 | -0.36 | 0.01 | -0.85 | 1.29 | -0.74 | 0.05 | -0.31 | -0.0018 | -0.0034 | -11.68 | 7 |
| 61 | 0.16 | -1.56 | -3.92 | -3.45 | 1.46 | -1.63 | -7.08 | -4.94 | -0.0098 | -0.0132 | -11.68 | 21 |
| 62 | -1.15 | -0.35 | -4.19 | -2.97 | 0.10 | -1.01 | -5.74 | -3.55 | -0.0188 | -0.0216 | -11.68 | 11 |
| 63 | -0.98 | -0.03 | -4.63 | -2.32 | 0.36 | -0.66 | -5.46 | -2.44 | -0.0222 | -0.0238 | -9.54 | 5 |
| 64 | -0.84 | 0.11 | -4.94 | -2.41 | 0.41 | -0.46 | -5.72 | -2.57 | -0.0216 | -0.0223 | -2.42 | 3 |
| 65 | -0.43 | -0.33 | -3.51 | -2.07 | 1.03 | -0.82 | -4.91 | -2.37 | -0.0182 | -0.0172 | -8.20 | 6 |
| 66 | -0.80 | -0.65 | -4.24 | -2.87 | 0.34 | -0.88 | -6.00 | -3.18 | -0.0210 | -0.0235 | -9.01 | 12 |
| 67 | -2.07 | -0.84 | -2.77 | -3.45 | -1.46 | -1.04 | -6.10 | -4.87 | -0.0064 | -0.0102 | -11.69 | 16 |
| 68 | -3.01 | -0.75 | -2.74 | -3.66 | -2.59 | -1.10 | -5.19 | -4.88 | -0.0042 | -0.0098 | 4.24 | 14 |
| 69 | -3.81 | 0.38 | -4.44 | -4.05 | -3.69 | -0.38 | -5.84 | -5.01 | -0.0104 | -0.0121 | 3.64 | 4 |
| 70 | -3.93 | -0.08 | 1.55 | -1.55 | -3.62 | -0.54 | 0.76 | -1.92 | 0.0052 | 0.0104 | 11.67 | 9 |
| 71 | -3.68 | -1.15 | -2.51 | -4.39 | -3.45 | -1.42 | -6.18 | -6.39 | -0.0033 | -0.0054 | -4.24 | 13 |
| 72 | -2.79 | -1.09 | -3.66 | -4.21 | -2.37 | -1.23 | -5.22 | -4.94 | -0.0109 | -0.0152 | -11.70 | 19 |
| 73 | -2.47 | -0.40 | -3.94 | -3.76 | -1.84 | -0.84 | -5.01 | -4.12 | -0.0204 | -0.0232 | 11.41 | 4 |
| 74 | -2.16 | -0.45 | -2.43 | -2.98 | -1.38 | -0.87 | -4.95 | -3.97 | -0.0219 | -0.0225 | 1.89 | 6 |
| 75 | 0.12 | -0.27 | -3.97 | -2.22 | 1.52 | -0.69 | -5.40 | -2.28 | -0.0162 | -0.0174 | -10.67 | 2 |
| 76 | 0.66 | 0.43 | -5.32 | -1.03 | 2.37 | 0.12 | -6.16 | -0.92 | -0.0088 | -0.0093 | 11.67 | 2 |
| 77 | 0.96 | 0.33 | -5.81 | -0.96 | 2.65 | 0.11 | -6.50 | -0.77 | -0.0106 | -0.0097 | 7.01 | 4 |
| 78 | 1.46 | -0.14 | -4.60 | -1.10 | 3.32 | -0.18 | -5.55 | -0.76 | -0.0077 | -0.0083 | 8.34 | 6 |
| 79 | 1.76 | -0.80 | -3.73 | -1.18 | 3.74 | -0.85 | -5.14 | -1.07 | -0.0135 | -0.0103 | -11.68 | 7 |
| 80 | 2.25 | -0.68 | 4.44 | 2.45 | 3.41 | -0.24 | 2.10 | 1.68 | 0.0187 | 0.0180 | 11.67 | 6 |
| 81 | 2.40 | -0.22 | 10.00 | 6.32 | 4.26 | 0.06 | 5.68 | 4.98 | 0.0113 | 0.0106 | 10.09 | 4 |
| 82 | 1.86 | -0.22 | 7.84 | 5.37 | 3.39 | 0.34 | 4.50 | 4.37 | 0.0155 | 0.0158 | -11.66 | 12 |
| 83 | 1.85 | -1.04 | 7.74 | 4.76 | 3.89 | -0.72 | 4.14 | 3.49 | 0.0201 | 0.0202 | 11.69 | 14 |
| 84 | 2.32 | -1.27 | 6.46 | 3.93 | 3.77 | -1.38 | 2.99 | 2.55 | 0.0196 | 0.0204 | 1.36 | 11 |
| 85 | 1.32 | -1.46 | 7.70 | 3.74 | 2.73 | -1.08 | 3.62 | 2.12 | 0.0192 | 0.0189 | -2.79 | 8 |
| 86 | 1.13 | -1.09 | 8.86 | 4.57 | 2.53 | -0.61 | 4.08 | 2.95 | 0.0191 | 0.0193 | -0.46 | 3 |
| 87 | 0.98 | -0.52 | 3.96 | 2.38 | 2.34 | -0.47 | -0.17 | 1.08 | 0.0218 | 0.0231 | 11.71 | 4 |
| 88 | -1.12 | 0.40 | -4.66 | -2.71 | -0.10 | -0.28 | -5.73 | -3.18 | -0.0157 | -0.0148 | -10.92 | 4 |
| 89 | -1.93 | 0.36 | -5.17 | -3.73 | -1.21 | -0.07 | -5.58 | -3.96 | -0.0196 | -0.0160 | -7.40 | 10 |
| 90 | -2.70 | -0.02 | -4.46 | -3.93 | -2.24 | -0.31 | -5.68 | -4.60 | 0.0163 | 0.0231 | -1.36 | 12 |
| 91 | -4.43 | -0.98 | -3.62 | -5.26 | -4.48 | -1.03 | -7.66 | -7.77 | -0.0028 | -0.0018 | -11.68 | 23 |
| 92 | -4.68 | 0.41 | -3.69 | -4.32 | -4.99 | -0.14 | -4.98 | -5.45 | -0.0044 | -0.0044 | 9.42 | 13 |
| 93 | -2.23 | -1.58 | 1.05 | -2.10 | -1.61 | -1.55 | -2.23 | -4.04 | 0.0222 | 0.0237 | -11.68 | 15 |
| 94 | -0.12 | -2.58 | 6.68 | 1.53 | 1.11 | -2.44 | 3.64 | 0.23 | 0.0221 | 0.0221 | -11.69 | 9 |
| 95 | -0.43 | -2.70 | 6.68 | 1.17 | 1.05 | -2.98 | 2.97 | -0.52 | 0.0217 | 0.0236 | 11.69 | 22 |
| 96 | -0.60 | -1.95 | 7.81 | 2.32 | 0.66 | -2.07 | 3.94 | 0.44 | 0.0223 | 0.0232 | -11.69 | 11 |
| 97 | -1.47 | -2.77 | 3.94 | -0.33 | -0.68 | -3.02 | -0.51 | -2.80 | -0.0152 | -0.0181 | 11.77 | 82 |
| 98 | -3.81 | -2.75 | -2.05 | -5.50 | -3.64 | -3.69 | -4.39 | -6.94 | 0.0042 | 0.0031 | -11.73 | 74 |
| 99 | -3.71 | -1.63 | -0.69 | -4.69 | -3.34 | -1.88 | -0.70 | -4.72 | 0.0086 | 0.0100 | -11.65 | 10 |
| 100 | -3.15 | -0.96 | -6.07 | -6.50 | -2.65 | -1.45 | -8.64 | -7.82 | -0.0066 | -0.0074 | -11.69 | 14 |
| 101 | -3.02 | -1.68 | -5.04 | -6.38 | -2.69 | -1.91 | -9.23 | -8.62 | 0.0026 | 0.0028 | -11.66 | 19 |
| 102 | -2.81 | -0.68 | -5.71 | -5.41 | -2.43 | -1.05 | -7.80 | -6.26 | -0.0012 | -0.0018 | -11.68 | 9 |
| 103 | -3.02 | 0.29 | -5.48 | -4.07 | -2.85 | -0.26 | -6.75 | -4.86 | -0.0005 | -0.0013 | -11.69 | 7 |
| 104 | -2.69 | -0.01 | -6.06 | -4.32 | -2.37 | -0.52 | -7.48 | -5.28 | -0.0007 | -0.0037 | -11.66 | 6 |
| 105 | 1.24 | -0.90 | -6.19 | -3.12 | 3.17 | -1.03 | -6.76 | -2.31 | -0.0069 | -0.0093 | -11.69 | 2 |
| 106 | 1.69 | -1.43 | -5.24 | -2.75 | 3.79 | -1.24 | -5.76 | -1.69 | -0.0037 | -0.0066 | -11.68 | 6 |
| 107 | 1.76 | -3.76 | -4.52 | -4.07 | 3.95 | -4.04 | -7.82 | -5.24 | 0.0052 | 0.0116 | -11.68 | 22 |
| 108 | 1.95 | -2.45 | -1.18 | -1.82 | 4.25 | -2.49 | -0.21 | -0.09 | 0.0166 | 0.0171 | -11.67 | 12 |
| 109 | 1.74 | -1.46 | -6.14 | -2.88 | 3.82 | -1.37 | -6.65 | -2.08 | -0.0049 | -0.0064 | -11.68 | 6 |
| 110 | 2.11 | -2.37 | -5.43 | -2.77 | 4.30 | -2.33 | -6.90 | -2.43 | -0.0039 | -0.0018 | -11.68 | 12 |
| 111 | -0.39 | -1.76 | -0.29 | -2.16 | 1.00 | -1.61 | -0.33 | -1.56 | 0.0213 | 0.0220 | -11.65 | 13 |
| 112 | -2.54 | -0.28 | -5.48 | -4.13 | -2.03 | -0.47 | -6.87 | -4.63 | -0.0017 | 0.0004 | -10.96 | 10 |
| 113 | -2.27 | -0.22 | -1.01 | -2.11 | -1.67 | -0.30 | -0.18 | -1.34 | 0.0201 | 0.0235 | -11.67 | 5 |
| 114 | -0.86 | -0.21 | -6.11 | -3.71 | 0.14 | -0.30 | -6.33 | -3.28 | -0.0196 | -0.0200 | -1.97 | 6 |
| 115 | 0.52 | -2.46 | -6.16 | -4.88 | 1.82 | -2.61 | -8.43 | -6.00 | 0.0051 | 0.0100 | -11.67 | 21 |
| 116 | 0.89 | -2.16 | -2.64 | -3.53 | 2.72 | -2.17 | -0.49 | -1.33 | 0.0200 | 0.0201 | -11.66 | 5 |
| 117 | 1.50 | -2.31 | -7.48 | -4.21 | 3.56 | -1.80 | -6.96 | -2.86 | -0.0001 | -0.0001 | -11.67 | 2 |
| 118 | 1.65 | -2.52 | -3.92 | -2.78 | 3.49 | -2.07 | -5.66 | -2.50 | -0.0050 | -0.0059 | -11.70 | 13 |
| 119 | -1.87 | -1.17 | -0.20 | -2.67 | -1.16 | -1.21 | -0.30 | -2.53 | 0.0224 | 0.0232 | -11.65 | 14 |
| 120 | -1.29 | -1.04 | -7.62 | -5.37 | -0.33 | -0.96 | -8.36 | -5.23 | 0.0057 | 0.0039 | -11.68 | 12 |
| 121 | -0.36 | -1.36 | -6.19 | -4.61 | 1.00 | -1.37 | -7.67 | -4.60 | 0.0108 | 0.0078 | -11.67 | 12 |
| 122 | -1.82 | -1.54 | -5.14 | -4.89 | -0.83 | -1.64 | -6.56 | -5.21 | -0.0088 | -0.0096 | -11.68 | 15 |
| 123 | -3.42 | -1.24 | -0.82 | -3.36 | -3.41 | -1.52 | -0.69 | -3.30 | 0.0080 | 0.0063 | -11.69 | 21 |
| 124 | -3.10 | -0.95 | -4.91 | -5.27 | -2.81 | -1.03 | -5.97 | -5.75 | -0.0051 | -0.0061 | -11.68 | 17 |
| 125 | -3.28 | -0.73 | -5.12 | -5.24 | -3.05 | -0.78 | -6.01 | -5.30 | -0.0059 | -0.0090 | -4.92 | 6 |
| 126 | -4.23 | -0.51 | -5.67 | -5.40 | -4.56 | -0.48 | -7.32 | -6.50 | 0.0046 | 0.0067 | -11.66 | 10 |
| 127 | -4.17 | -0.74 | -6.09 | -6.25 | -4.20 | -0.77 | -8.41 | -7.27 | 0.0049 | 0.0058 | -11.66 | 11 |
| 128 | -3.06 | 0.13 | -5.75 | -4.68 | -2.83 | -0.09 | -6.41 | -4.77 | -0.0017 | -0.0012 | -11.66 | 5 |
| 129 | -1.82 | 0.47 | -6.24 | -3.95 | -1.28 | 0.39 | -6.15 | -3.31 | -0.0056 | -0.0025 | 11.68 | 4 |
| 130 | -0.45 | -1.07 | -5.52 | -4.09 | 0.57 | -1.01 | -7.40 | -4.61 | -0.0154 | -0.0181 | 0.68 | 8 |

| | | | | | | | | | | | | |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|--------|-----|
| 131 | -0.07 | -1.48 | -3.99 | -3.61 | 1.19 | -1.36 | -5.94 | -3.77 | 0.0025 | 0.0009 | -11.68 | 6 |
| 132 | -0.14 | -0.81 | -0.68 | -1.69 | 0.95 | -0.74 | 0.65 | -0.16 | 0.0146 | 0.0153 | -11.66 | 4 |
| 133 | -2.17 | -1.07 | -4.39 | -4.21 | -1.73 | -1.06 | -6.02 | -5.14 | -0.0007 | 0.0005 | -11.66 | 15 |
| 134 | -3.00 | -0.23 | -2.68 | -3.19 | -2.67 | -0.56 | -4.15 | -4.08 | -0.0001 | 0.0029 | -11.68 | 14 |
| 135 | -1.62 | -0.06 | -5.41 | -3.86 | -0.78 | -0.19 | -6.16 | -3.71 | -0.0034 | 0.0006 | -11.68 | 9 |
| 136 | -5.04 | 2.35 | -0.32 | -0.92 | -6.43 | 1.95 | -1.05 | -2.03 | 0.0114 | 0.0131 | 6.22 | 12 |
| 137 | -2.51 | -0.62 | 1.58 | 0.23 | -2.28 | -0.69 | -0.97 | -1.57 | 0.0099 | 0.0114 | 8.91 | 16 |
| 138 | -2.82 | -2.58 | -5.56 | -6.62 | -2.41 | -2.99 | -8.39 | -8.40 | 0.0072 | 0.0079 | -11.65 | 28 |
| 139 | -2.71 | -1.23 | -5.67 | -5.37 | -2.30 | -1.35 | -6.92 | -5.75 | 0.0031 | 0.0041 | -11.69 | 7 |
| 140 | -4.35 | 0.09 | -5.98 | -5.61 | -4.51 | -0.38 | -6.25 | -5.99 | -0.0043 | -0.0027 | -11.68 | 7 |
| 141 | -3.81 | 0.25 | -4.94 | -4.46 | -4.08 | -0.26 | -5.94 | -5.37 | 0.0076 | 0.0120 | 11.66 | 4 |
| 142 | -2.52 | -0.40 | -5.09 | -4.24 | -1.95 | -0.51 | -5.64 | -4.10 | -0.0024 | 0.0008 | -11.66 | 5 |
| 143 | -0.92 | 0.03 | 1.75 | 0.80 | -0.20 | 0.14 | 1.09 | 0.84 | 0.0221 | 0.0231 | -11.62 | 8 |
| 144 | -1.02 | 0.32 | 4.79 | 3.94 | -0.35 | 0.24 | 2.48 | 2.58 | 0.0213 | 0.0207 | -11.65 | 29 |
| 145 | -1.46 | -3.16 | 3.90 | -0.81 | -0.77 | -3.32 | -0.05 | -3.42 | 0.0111 | 0.0121 | -11.68 | 93 |
| 146 | -1.21 | -3.21 | 3.69 | -0.81 | -0.35 | -3.33 | 0.26 | -2.86 | 0.0092 | 0.0096 | -11.68 | 28 |
| 147 | -3.32 | -1.80 | 5.28 | 0.57 | -3.28 | -1.70 | 1.07 | -2.24 | 0.0149 | 0.0187 | -11.64 | 15 |
| 148 | -3.76 | -0.74 | 7.28 | 1.70 | -4.15 | -0.67 | 4.74 | 0.03 | 0.0168 | 0.0210 | -11.69 | 8 |
| 149 | -3.21 | -0.86 | 6.64 | 1.53 | -3.26 | -0.90 | 3.62 | -0.55 | 0.0183 | 0.0214 | -11.66 | 9 |
| 150 | -2.72 | -0.98 | 6.58 | 1.91 | -2.62 | -0.98 | 4.07 | -0.01 | 0.0179 | 0.0223 | -11.66 | 24 |
| 151 | -2.03 | -1.75 | 3.07 | -0.30 | -1.51 | -1.71 | 1.09 | -1.37 | 0.0204 | 0.0227 | -11.66 | 22 |
| 152 | -1.08 | -1.41 | -6.91 | -5.66 | -0.19 | -1.69 | -8.39 | -6.08 | 0.0058 | 0.0046 | -11.68 | 10 |
| 153 | -1.86 | -1.44 | -6.49 | -5.47 | -1.17 | -1.31 | -7.57 | -5.55 | 0.0101 | 0.0116 | -11.66 | 8 |
| 154 | -3.38 | -0.26 | -0.77 | -2.82 | -3.32 | -0.42 | 0.68 | -1.99 | 0.0209 | 0.0238 | -11.67 | 6 |
| 155 | -3.62 | -0.67 | 0.00 | -2.73 | -3.73 | -0.56 | 0.23 | -2.45 | 0.0179 | 0.0231 | -11.66 | 11 |
| 156 | -2.26 | -0.38 | -5.63 | -4.32 | -1.81 | -0.48 | -5.80 | -4.16 | 0.0018 | 0.0077 | -11.70 | 12 |
| 157 | -1.90 | -0.73 | -7.06 | -5.04 | -1.59 | -0.64 | -9.00 | -6.02 | 0.0171 | 0.0230 | -11.67 | 24 |
| 158 | -0.98 | -0.74 | -5.81 | -4.33 | -0.10 | -0.71 | -7.09 | -4.55 | 0.0176 | 0.0194 | -11.67 | 15 |
| 159 | -2.69 | -0.84 | -3.29 | -3.72 | -2.41 | -0.90 | -4.21 | -4.25 | 0.0056 | 0.0086 | -2.03 | 11 |
| 160 | -2.91 | -1.66 | 0.72 | -2.93 | -3.08 | -1.70 | -0.80 | -3.83 | 0.0066 | 0.0126 | 0.02 | 64 |
| 161 | -4.69 | -0.43 | -4.07 | -5.43 | -4.97 | -1.03 | -4.21 | -5.83 | 0.0112 | 0.0170 | -11.66 | 5 |
| 162 | -4.38 | -1.39 | -5.93 | -6.74 | -5.06 | -1.53 | -8.63 | -8.82 | 0.0011 | 0.0034 | -11.68 | 21 |
| 163 | -4.69 | 0.01 | -0.90 | -2.81 | -5.10 | -0.45 | -0.51 | -2.99 | 0.0174 | 0.0218 | -11.62 | 25 |
| 164 | -4.38 | -0.43 | -7.07 | -6.87 | -4.68 | -0.72 | -7.36 | -7.13 | 0.0048 | 0.0088 | -11.69 | 15 |
| 165 | -2.52 | -1.21 | -5.44 | -4.91 | -2.45 | -1.00 | -7.10 | -5.68 | -0.0006 | 0.0027 | -11.66 | 10 |
| 166 | -2.31 | -0.35 | -0.06 | -1.74 | -2.06 | -0.19 | 0.54 | -1.01 | 0.0179 | 0.0171 | 0.52 | 29 |
| 167 | -1.81 | -0.79 | -0.96 | -2.36 | -1.10 | -0.94 | -0.59 | -1.98 | 0.0221 | 0.0238 | -11.63 | 23 |
| 168 | -1.67 | -0.36 | -5.14 | -4.43 | -1.07 | -0.67 | -5.48 | -4.37 | -0.0071 | 0.0010 | -11.67 | 5 |
| 169 | -3.89 | 0.40 | -4.60 | -4.69 | -4.02 | 0.05 | -4.54 | -4.87 | -0.0027 | 0.0046 | -1.94 | 6 |
| 170 | -5.24 | 0.43 | -4.45 | -5.29 | -5.85 | -0.11 | -5.26 | -6.30 | -0.0019 | 0.0012 | 11.68 | 10 |
| 171 | -4.89 | 0.91 | -5.90 | -5.23 | -5.16 | 0.19 | -6.29 | -5.97 | 0.0009 | 0.0062 | -8.37 | 6 |
| 172 | -2.71 | -0.10 | -6.92 | -5.44 | -2.61 | -0.11 | -7.02 | -5.41 | -0.0060 | 0.0011 | -8.77 | 6 |
| 173 | -2.05 | -0.55 | -4.16 | -4.13 | -1.75 | -0.55 | -4.62 | -3.91 | -0.0131 | -0.0091 | -11.67 | 6 |
| 174 | -1.61 | -0.32 | -1.05 | -2.05 | -1.06 | -0.21 | 0.45 | -0.66 | 0.0106 | 0.0108 | 11.67 | 11 |
| 175 | -1.97 | -0.34 | -4.75 | -4.04 | -1.52 | -0.53 | -6.35 | -4.77 | -0.0223 | -0.0237 | 11.71 | 27 |
| 176 | -2.42 | -1.01 | -5.08 | -5.02 | -2.09 | -1.40 | -6.85 | -5.85 | 0.0010 | -0.0019 | -11.67 | 15 |
| 177 | -2.92 | 0.10 | -6.20 | -4.79 | -2.61 | -0.32 | -5.89 | -4.38 | -0.0156 | -0.0191 | 6.89 | 6 |
| 178 | -2.44 | -1.80 | -0.79 | -3.61 | -2.54 | -1.61 | -2.10 | -4.56 | 0.0065 | 0.0101 | -11.65 | 40 |
| 179 | -2.75 | -1.64 | -4.53 | -5.53 | -2.24 | -1.74 | -6.37 | -6.63 | 0.0086 | 0.0103 | -11.65 | 18 |
| 180 | -2.42 | -1.66 | 1.89 | -0.43 | -2.46 | -1.73 | 0.72 | -1.72 | 0.0222 | 0.0237 | -11.66 | 10 |
| 181 | -1.66 | -1.04 | 10.18 | 4.52 | -1.72 | -1.10 | 7.33 | 2.03 | 0.0189 | 0.0228 | -11.67 | 8 |
| 182 | -1.47 | -0.22 | 4.16 | 1.68 | -1.40 | -0.54 | 2.30 | 0.44 | 0.0123 | 0.0125 | 11.68 | 4 |
| 183 | -2.95 | 0.26 | -4.93 | -3.78 | -2.85 | 0.03 | -5.58 | -4.07 | 0.0155 | 0.0143 | -11.66 | 7 |
| 184 | -3.21 | 0.28 | -6.50 | -4.81 | -3.18 | 0.00 | -5.77 | -4.25 | -0.0168 | -0.0131 | 11.68 | 4 |
| 185 | -2.62 | -0.21 | -4.96 | -3.86 | -2.48 | -0.15 | -5.60 | -3.99 | 0.0091 | 0.0191 | -2.23 | 8 |
| 186 | -1.25 | -0.18 | -5.13 | -3.78 | -0.60 | -0.18 | -4.99 | -3.08 | -0.0112 | -0.0014 | -11.64 | 8 |
| 187 | -0.10 | -1.42 | -6.10 | -4.55 | 0.76 | -1.09 | -7.91 | -4.71 | -0.0069 | 0.0017 | -11.65 | 9 |
| 188 | 0.37 | -0.76 | -5.21 | -3.41 | 1.64 | -0.72 | -5.70 | -2.81 | -0.0116 | -0.0098 | -11.68 | 5 |
| 189 | -2.76 | -0.27 | -5.57 | -4.65 | -2.49 | -0.37 | -6.15 | -4.71 | 0.0125 | 0.0194 | -11.65 | 5 |
| 190 | -3.19 | -0.08 | -5.52 | -5.30 | -3.15 | -0.38 | -6.09 | -5.32 | -0.0066 | -0.0038 | -11.67 | 6 |
| 191 | -4.51 | 0.52 | -3.93 | -4.36 | -4.90 | 0.11 | -5.03 | -5.07 | -0.0033 | 0.0004 | 2.38 | 6 |
| 192 | -4.08 | 0.02 | -6.18 | -5.06 | -4.51 | 0.07 | -7.11 | -5.82 | 0.0010 | 0.0044 | -11.66 | 20 |
| 193 | -2.42 | -0.17 | -4.99 | -4.03 | -2.69 | -0.21 | -5.93 | -4.45 | -0.0022 | 0.0023 | -11.66 | 34 |
| 194 | -3.58 | 0.26 | -6.31 | -5.38 | -3.47 | -0.29 | -7.09 | -5.88 | 0.0207 | 0.0236 | -11.66 | 9 |
| 195 | -2.23 | -0.53 | -1.09 | -2.23 | -2.07 | -0.76 | -0.41 | -1.96 | 0.0035 | 0.0087 | -11.64 | 42 |
| 196 | -1.89 | -1.42 | -5.05 | -5.14 | -1.59 | -1.55 | -7.54 | -6.28 | -0.0223 | -0.0238 | 11.70 | 51 |
| 197 | -2.08 | -2.72 | -2.08 | -4.82 | -1.91 | -2.82 | -6.21 | -7.14 | -0.0198 | -0.0218 | 11.81 | 164 |
| 198 | -3.81 | -2.76 | -2.87 | -5.20 | -3.85 | -3.82 | -3.39 | -6.14 | 0.0169 | 0.0212 | -11.70 | 50 |
| 199 | -6.54 | -0.06 | -6.78 | -6.84 | -7.54 | -0.81 | -6.29 | -7.39 | 0.0038 | 0.0053 | -11.67 | 8 |
| 200 | -6.10 | -0.24 | -6.24 | -7.03 | -6.88 | -0.80 | -7.02 | -7.98 | 0.0030 | 0.0042 | -11.67 | 12 |
| 201 | -5.84 | 0.29 | -5.08 | -5.51 | -6.38 | -0.35 | -5.39 | -6.22 | 0.0020 | 0.0025 | -11.65 | 14 |

| | | | | | | | | | | | | |
|-----|-------|-------|-------|-------|-------|-------|--------|-------|---------|---------|--------|-----|
| 202 | -5.26 | -2.21 | -5.04 | -7.36 | -6.15 | -2.33 | -8.08 | -9.96 | 0.0010 | 0.0019 | -11.67 | 36 |
| 203 | -2.62 | -2.05 | -6.55 | -6.93 | -2.00 | -2.39 | -6.99 | -6.99 | 0.0087 | 0.0113 | -11.67 | 7 |
| 204 | -0.99 | -3.02 | -6.55 | -6.94 | -0.29 | -3.06 | -9.49 | -8.39 | -0.0082 | -0.0079 | -11.70 | 12 |
| 205 | -2.76 | -1.89 | -3.66 | -5.82 | -2.21 | -2.19 | -5.60 | -6.56 | -0.0102 | -0.0123 | -3.11 | 23 |
| 206 | -2.39 | -1.53 | -6.26 | -6.40 | -1.82 | -1.93 | -6.86 | -6.68 | 0.0014 | -0.0004 | -11.69 | 5 |
| 207 | -2.05 | -1.06 | -6.37 | -5.58 | -1.26 | -1.34 | -6.09 | -5.14 | 0.0025 | 0.0039 | -11.68 | 5 |
| 208 | -2.55 | -1.93 | -5.77 | -6.70 | -2.33 | -1.79 | -7.92 | -7.66 | 0.0025 | 0.0043 | -11.67 | 19 |
| 209 | -4.13 | -0.46 | -1.70 | -3.92 | -4.03 | -1.08 | 0.12 | -3.11 | 0.0201 | 0.0232 | -11.65 | 7 |
| 210 | 0.82 | -2.86 | -5.96 | -4.98 | 2.07 | -2.89 | -7.65 | -5.56 | -0.0198 | -0.0226 | -11.68 | 32 |
| 211 | 1.00 | -3.27 | -3.89 | -4.46 | 2.35 | -3.56 | -6.15 | -5.36 | 0.0224 | 0.0220 | -11.66 | 27 |
| 212 | -1.27 | -1.35 | -4.80 | -4.99 | -0.20 | -1.84 | -5.06 | -4.85 | -0.0098 | -0.0238 | -11.70 | 8 |
| 213 | -1.80 | -1.85 | -6.16 | -5.94 | -1.42 | -1.75 | -8.38 | -6.90 | 0.0119 | 0.0138 | -11.68 | 21 |
| 214 | -1.99 | -1.33 | -6.62 | -5.86 | -1.28 | -1.66 | -8.27 | -6.61 | -0.0002 | -0.0001 | -11.68 | 12 |
| 215 | -1.28 | -1.59 | -5.97 | -5.71 | -0.21 | -1.54 | -7.51 | -6.12 | 0.0061 | 0.0050 | -11.69 | 10 |
| 216 | -0.12 | -1.40 | -5.83 | -4.44 | 1.34 | -1.66 | -6.93 | -4.52 | -0.0028 | -0.0074 | -11.67 | 9 |
| 217 | 1.56 | -3.19 | -6.01 | -4.84 | 3.47 | -3.30 | -8.77 | -5.44 | 0.0029 | 0.0097 | -11.68 | 17 |
| 218 | 0.07 | -2.86 | -5.64 | -5.29 | 1.27 | -3.02 | -7.49 | -5.71 | -0.0134 | -0.0192 | -11.58 | 25 |
| 219 | -2.39 | -2.17 | -5.54 | -6.61 | -1.78 | -2.43 | -6.97 | -7.44 | 0.0031 | 0.0009 | -11.67 | 16 |
| 220 | -2.14 | -1.64 | -6.37 | -5.95 | -1.61 | -1.67 | -7.36 | -6.42 | -0.0040 | -0.0076 | -11.68 | 7 |
| 221 | -3.34 | -1.07 | -5.38 | -6.01 | -2.99 | -1.06 | -6.66 | -6.31 | -0.0003 | 0.0013 | -11.68 | 6 |
| 222 | -2.72 | -0.59 | -5.69 | -5.31 | -2.18 | -0.79 | -6.23 | -5.25 | -0.0003 | 0.0017 | -11.68 | 5 |
| 223 | -1.69 | -2.02 | -4.54 | -5.36 | -1.07 | -2.17 | -6.46 | -6.51 | -0.0009 | 0.0031 | -11.65 | 25 |
| 224 | -0.81 | -3.81 | -4.64 | -6.59 | 0.19 | -4.16 | -9.72 | -9.39 | 0.0038 | 0.0053 | -11.65 | 47 |
| 225 | -0.93 | -4.64 | -2.84 | -6.12 | -0.09 | -4.18 | -7.66 | -8.90 | 0.0014 | 0.0028 | -11.63 | 123 |
| 226 | -3.93 | -1.24 | -3.94 | -5.18 | -3.90 | -1.73 | -4.08 | -5.37 | 0.0061 | 0.0073 | -11.69 | 19 |
| 227 | -4.19 | 0.18 | -2.10 | -4.05 | -4.32 | -0.65 | -0.15 | -3.47 | 0.0114 | 0.0153 | -11.67 | 12 |
| 228 | -5.63 | 0.21 | -6.58 | -6.44 | -6.20 | -0.50 | -8.12 | -7.59 | 0.0033 | 0.0049 | -11.66 | 8 |
| 229 | -5.55 | 0.36 | -6.65 | -6.42 | -6.18 | -0.29 | -7.78 | -7.61 | -0.0006 | 0.0015 | -11.68 | 7 |
| 230 | -4.55 | -0.10 | -0.07 | -2.02 | -5.08 | -0.58 | -1.18 | -3.24 | 0.0214 | 0.0237 | -11.66 | 6 |
| 231 | -2.69 | -0.21 | 13.07 | 5.53 | -2.62 | -0.47 | 8.94 | 3.29 | 0.0197 | 0.0232 | -11.67 | 3 |
| 232 | -2.36 | -0.12 | 13.37 | 5.87 | -2.21 | -0.45 | 9.70 | 3.70 | 0.0215 | 0.0239 | -3.69 | 4 |
| 233 | -2.06 | -0.09 | 12.50 | 5.95 | -1.83 | -0.24 | 8.83 | 4.04 | 0.0222 | 0.0236 | 1.01 | 4 |
| 234 | -2.33 | -1.85 | 3.84 | 0.01 | -2.02 | -1.98 | 1.52 | -1.65 | 0.0042 | 0.0032 | -11.69 | 10 |
| 235 | -2.93 | 0.00 | -6.99 | -4.99 | -2.52 | -0.48 | -6.71 | -4.98 | 0.0028 | 0.0057 | -11.66 | 2 |
| 236 | -2.55 | -0.17 | -1.53 | -2.75 | -1.89 | -0.77 | -0.41 | -2.08 | 0.0177 | 0.0223 | -11.66 | 7 |
| 237 | -1.23 | -0.43 | -6.01 | -4.18 | -0.33 | -0.68 | -5.77 | -3.99 | 0.0050 | 0.0102 | -11.67 | 8 |
| 238 | -2.44 | -0.51 | -6.07 | -4.80 | -1.90 | -0.80 | -5.27 | -4.32 | 0.0031 | 0.0018 | -11.66 | 3 |
| 239 | -2.05 | -1.13 | -5.91 | -4.93 | -1.71 | -1.04 | -7.14 | -5.37 | 0.0081 | 0.0115 | -11.67 | 5 |
| 240 | -3.02 | -0.01 | -5.24 | -4.18 | -2.80 | -0.31 | -5.75 | -4.47 | 0.0001 | 0.0024 | 4.71 | 7 |
| 241 | -2.60 | -0.85 | -4.90 | -4.89 | -2.34 | -0.97 | -7.12 | -6.07 | -0.0059 | -0.0001 | 11.69 | 27 |
| 242 | -3.60 | -1.77 | -5.39 | -6.82 | -3.44 | -1.74 | -9.11 | -8.85 | 0.0015 | 0.0019 | -11.66 | 35 |
| 243 | -3.36 | -0.77 | -5.76 | -5.53 | -3.05 | -1.01 | -8.07 | -6.77 | 0.0009 | 0.0019 | -11.68 | 12 |
| 244 | -2.48 | -1.10 | -7.40 | -6.08 | -1.97 | -1.13 | -9.45 | -7.17 | 0.0038 | 0.0060 | -11.67 | 14 |
| 245 | -0.97 | -2.07 | -6.19 | -5.12 | 0.25 | -1.95 | -8.71 | -6.18 | -0.0208 | -0.0209 | -11.69 | 16 |
| 246 | -0.06 | -3.06 | -6.08 | -5.72 | 1.09 | -3.07 | -10.04 | -7.59 | 0.0090 | 0.0104 | -11.66 | 23 |
| 247 | -1.83 | -0.41 | -5.03 | -4.32 | -0.96 | -1.03 | -5.38 | -4.62 | -0.0139 | -0.0161 | -11.67 | 7 |
| 248 | -4.17 | -0.92 | -5.79 | -6.27 | -4.32 | -1.19 | -7.19 | -7.45 | 0.0024 | 0.0051 | 5.82 | 18 |
| 249 | -3.06 | -2.38 | 0.28 | -2.10 | -2.91 | -2.13 | -0.93 | -2.96 | 0.0168 | 0.0174 | -11.66 | 7 |
| 250 | -3.47 | 0.51 | 10.18 | 4.18 | -3.64 | 0.26 | 5.94 | 1.61 | 0.0221 | 0.0238 | -11.64 | 12 |
| 251 | -2.66 | -0.93 | 6.04 | 2.53 | -2.40 | -1.17 | 3.38 | 0.62 | 0.0173 | 0.0197 | -11.65 | 15 |
| 252 | -2.02 | -1.46 | 1.79 | -0.81 | -1.56 | -1.79 | -1.32 | -2.70 | -0.0002 | -0.0027 | -11.71 | 17 |
| 253 | -2.36 | -0.29 | -6.75 | -4.78 | -1.87 | -0.60 | -6.91 | -4.93 | -0.0208 | -0.0231 | -11.70 | 5 |
| 254 | -1.94 | -0.35 | -6.06 | -4.17 | -1.36 | -0.43 | -6.49 | -4.27 | -0.0119 | -0.0128 | -11.52 | 4 |
| 255 | -1.98 | 0.15 | -5.64 | -3.53 | -1.26 | -0.19 | -5.98 | -3.64 | -0.0207 | -0.0227 | -11.67 | 4 |
| 256 | -2.50 | -1.13 | -5.48 | -5.81 | -2.06 | -1.36 | -8.99 | -7.97 | -0.0058 | -0.0038 | -9.89 | 21 |
| 257 | -5.15 | -0.24 | -6.14 | -6.28 | -5.49 | -0.71 | -7.71 | -7.64 | 0.0053 | 0.0059 | -11.65 | 10 |
| 258 | -4.05 | -0.14 | -6.52 | -5.44 | -4.15 | -0.58 | -7.77 | -6.49 | 0.0032 | 0.0054 | -11.69 | 4 |
| 259 | -2.61 | 0.00 | -5.54 | -4.00 | -2.07 | -0.19 | -5.73 | -4.03 | -0.0198 | -0.0173 | 0.59 | 12 |
| 260 | -1.89 | -1.51 | -4.22 | -4.76 | -1.02 | -1.82 | -7.89 | -6.47 | -0.0186 | -0.0215 | -5.88 | 29 |
| 261 | -2.86 | -1.18 | -3.04 | -4.64 | -2.31 | -1.74 | -6.02 | -5.95 | -0.0172 | -0.0199 | 3.07 | 56 |
| 262 | -2.81 | -2.68 | -4.46 | -6.33 | -2.41 | -3.57 | -5.15 | -7.07 | 0.0059 | 0.0065 | -11.71 | 70 |
| 263 | -2.59 | -2.06 | -5.42 | -6.29 | -2.14 | -2.47 | -7.76 | -7.95 | 0.0022 | 0.0022 | -11.68 | 30 |
| 264 | -2.88 | -1.34 | -6.28 | -6.39 | -2.31 | -1.84 | -8.14 | -7.34 | 0.0032 | 0.0026 | -11.69 | 12 |
| 265 | -4.42 | -0.23 | -6.44 | -6.03 | -4.65 | -0.76 | -8.71 | -7.58 | 0.0020 | 0.0026 | -11.66 | 9 |
| 266 | -4.03 | -0.42 | -6.75 | -6.13 | -4.19 | -0.68 | -7.37 | -6.81 | 0.0021 | 0.0020 | -11.66 | 6 |
| 267 | -2.21 | -0.18 | -6.30 | -5.11 | -3.03 | -0.77 | -7.27 | -5.92 | 0.0062 | 0.0075 | -11.65 | 7 |
| 268 | -1.07 | -1.07 | -4.59 | -4.27 | -0.04 | -1.36 | -5.48 | -4.58 | -0.0218 | -0.0231 | 1.20 | 12 |
| 269 | -1.27 | -2.53 | -6.49 | -6.52 | -0.09 | -2.43 | -9.38 | -7.60 | -0.0050 | -0.0051 | -11.67 | 19 |
| 270 | -3.21 | -1.88 | -4.70 | -6.18 | -2.83 | -1.99 | -8.42 | -8.26 | 0.0032 | 0.0037 | -11.68 | 24 |
| 271 | -2.97 | -0.61 | -6.61 | -5.66 | -2.51 | -1.00 | -8.51 | -6.69 | 0.0054 | 0.0067 | -11.69 | 11 |
| 272 | -3.34 | -0.88 | -6.37 | -5.93 | -2.94 | -1.14 | -8.94 | -7.34 | 0.0002 | 0.0024 | -11.67 | 12 |

| | | | | | | | | | | | | |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|---------|---------|--------|-----|
| 273 | -4.23 | -0.29 | -5.57 | -5.99 | -4.14 | -0.84 | -7.01 | -6.88 | -0.0017 | -0.0018 | -10.98 | 7 |
| 274 | -3.61 | -2.32 | -4.69 | -6.71 | -3.60 | -2.53 | -9.82 | -9.88 | -0.0044 | -0.0057 | -11.68 | 51 |
| 275 | -3.65 | -0.83 | -5.87 | -5.60 | -3.51 | -1.29 | -8.20 | -6.93 | 0.0039 | 0.0054 | -11.67 | 13 |
| 276 | -3.36 | -0.66 | -5.80 | -5.53 | -3.14 | -1.02 | -7.41 | -6.69 | -0.0035 | -0.0013 | -11.69 | 10 |
| 277 | -3.55 | -0.48 | 0.62 | -2.64 | -3.81 | -0.88 | -1.57 | -4.35 | 0.0041 | 0.0067 | 10.06 | 30 |
| 278 | -3.98 | -1.65 | -4.27 | -6.00 | -4.16 | -1.68 | -9.46 | -9.07 | -0.0104 | -0.0118 | 11.74 | 63 |
| 279 | -5.41 | -2.34 | -1.38 | -5.25 | -5.89 | -2.78 | -7.44 | -9.00 | -0.0055 | -0.0055 | -11.69 | 116 |
| 280 | -4.60 | -0.56 | -5.59 | -5.71 | -4.78 | -1.54 | -5.78 | -6.43 | 0.0027 | 0.0035 | -11.69 | 4 |
| 281 | -4.10 | -0.40 | -6.99 | -6.21 | -4.20 | -1.14 | -7.99 | -7.16 | -0.0022 | -0.0032 | -11.68 | 4 |
| 282 | -3.57 | 0.09 | -5.48 | -4.79 | -3.39 | -0.79 | -5.53 | -5.45 | -0.0009 | -0.0012 | -11.66 | 2 |
| 283 | -3.18 | 0.14 | -4.49 | -3.99 | -2.79 | -0.58 | -4.99 | -4.59 | -0.0051 | -0.0074 | -11.71 | 4 |
| 284 | -2.18 | -0.86 | -4.23 | -4.24 | -1.63 | -1.12 | -7.39 | -5.65 | 0.0030 | 0.0052 | -11.65 | 8 |
| 285 | -1.34 | -1.39 | -5.90 | -5.34 | -0.33 | -1.69 | -8.72 | -6.79 | 0.0011 | 0.0018 | -11.67 | 15 |
| 286 | -3.50 | -0.44 | -6.62 | -5.54 | -3.14 | -0.88 | -7.75 | -6.34 | 0.0019 | 0.0023 | -11.68 | 6 |
| 287 | -2.89 | -0.78 | -0.56 | -2.24 | -2.45 | -1.39 | -1.31 | -2.62 | 0.0112 | 0.0159 | -11.66 | 36 |
| 288 | -1.82 | -2.98 | 1.14 | -3.31 | -1.22 | -3.08 | -2.15 | -5.31 | 0.0015 | 0.0023 | -11.68 | 45 |
| 289 | -2.29 | -0.78 | -5.92 | -5.12 | -1.58 | -1.43 | -7.27 | -5.84 | -0.0099 | -0.0157 | -11.70 | 8 |
| 290 | -2.02 | -0.53 | -5.20 | -4.52 | -1.17 | -1.19 | -6.69 | -5.30 | -0.0168 | -0.0192 | -11.70 | 10 |
| 291 | -4.01 | 0.13 | -5.90 | -5.32 | -3.96 | -0.44 | -7.48 | -6.52 | -0.0087 | -0.0109 | -11.66 | 11 |
| 292 | -4.91 | 0.51 | -5.97 | -5.88 | -5.20 | -0.20 | -7.87 | -7.31 | -0.0017 | -0.0023 | -11.68 | 9 |
| 293 | -4.24 | 0.28 | -7.57 | -5.74 | -4.35 | -0.19 | -8.65 | -6.66 | -0.0044 | -0.0061 | -11.68 | 9 |
| 294 | -1.45 | 0.17 | -1.60 | -1.99 | -0.60 | -0.39 | 0.27 | -0.92 | 0.0216 | 0.0237 | -11.66 | 3 |
| 295 | -0.38 | 0.13 | -1.78 | -1.73 | 0.84 | -0.52 | 0.09 | -0.66 | -0.0095 | -0.0105 | -11.67 | 3 |
| 296 | 0.24 | -0.80 | -6.01 | -4.09 | 1.77 | -1.28 | -8.09 | -5.12 | -0.0223 | -0.0238 | 8.60 | 16 |
| 297 | -3.05 | -1.19 | -5.18 | -5.28 | -2.75 | -1.41 | -7.36 | -6.53 | 0.0038 | 0.0039 | -11.66 | 15 |
| 298 | -3.84 | -0.42 | -5.39 | -5.23 | -3.87 | -0.81 | -7.61 | -6.84 | -0.0018 | -0.0028 | -11.67 | 9 |
| 299 | -4.16 | 0.13 | -0.52 | -2.78 | -3.90 | -0.50 | -0.71 | -3.34 | 0.0103 | 0.0146 | -11.65 | 6 |
| 300 | -3.26 | -0.47 | -5.65 | -5.13 | -2.90 | -0.72 | -8.10 | -6.36 | -0.0050 | -0.0052 | -11.68 | 8 |
| 301 | -1.22 | -0.36 | 4.43 | 1.17 | -0.30 | -0.63 | 1.38 | 0.39 | -0.0201 | -0.0232 | -11.69 | 4 |
| 302 | -3.07 | 0.08 | 7.47 | 2.96 | -2.84 | -0.04 | 4.80 | 1.37 | 0.0181 | 0.0210 | 8.86 | 20 |
| 303 | -3.16 | -2.29 | 4.37 | -0.42 | -2.71 | -2.50 | -0.04 | -3.23 | 0.0062 | 0.0081 | -11.72 | 34 |
| 304 | -2.78 | -0.49 | 0.37 | -1.88 | -2.34 | -0.99 | -1.56 | -3.08 | -0.0124 | -0.0169 | 9.35 | 15 |

APPENDIX D. LATE CALIBRATION ORBITAL RESULTS FOR ALL DATA

The columns of data below have the following format from left to right, where an orbit is defined only as a 6120second period:

1. Average decimal day of year 2000 of the field vector in this orbit.
2. Orbital average difference from zero of measured-minus-modeled field for all X (down) components in nT.
3. Orbital average difference from zero of measured-minus-modeled field for all Y (velocity) components in nT.
4. Orbital average difference from zero of measured-minus-modeled field for all Z (orbit normal) components in nT.
5. Orbital average magnitude of differences from zero of measured-minus-modeled field for all components in nT.
6. Number of vectors contributing to these averages.
7. Three hour Ap most closely corresponding to the value in column 1.

| | | | | | | |
|----------|-------|-------|--------|--------|------|----|
| 5.026771 | 40.45 | 72.09 | 158.55 | 193.71 | 4564 | 27 |
| 5.088889 | 49.79 | 70.05 | 177.58 | 215.78 | 6050 | 27 |
| 5.159711 | 43.39 | 65.31 | 174.48 | 206.03 | 6057 | 18 |
| 5.230544 | 34.39 | 73.70 | 172.22 | 201.38 | 6061 | 18 |
| 5.372234 | 29.53 | 78.99 | 179.29 | 212.70 | 6058 | 18 |
| 5.519537 | 31.96 | 65.18 | 163.79 | 190.78 | 5084 | 9 |
| 5.584676 | 33.09 | 64.03 | 182.23 | 211.25 | 6042 | 9 |
| 5.639711 | 40.00 | 53.12 | 200.21 | 222.21 | 3337 | 15 |
| 5.731215 | 36.88 | 61.94 | 167.59 | 200.20 | 5231 | 15 |
| 5.797245 | 33.07 | 55.62 | 176.60 | 200.59 | 6054 | 22 |
| 5.868090 | 32.10 | 56.61 | 173.64 | 201.25 | 6057 | 22 |
| 5.987998 | 51.76 | 66.83 | 200.07 | 233.62 | 2047 | 27 |
| 6.021910 | 34.00 | 43.82 | 28.71 | 73.20 | 3731 | 12 |
| 6.079167 | 41.29 | 49.70 | 28.90 | 80.31 | 6057 | 12 |
| 6.150012 | 39.73 | 52.34 | 32.22 | 83.05 | 6057 | 18 |
| 6.220810 | 33.21 | 66.77 | 27.84 | 89.81 | 6053 | 18 |
| 6.291678 | 31.62 | 40.68 | 14.99 | 59.67 | 6061 | 7 |
| 6.362488 | 25.76 | 47.21 | 28.15 | 70.07 | 6055 | 7 |
| 6.433333 | 26.99 | 51.43 | 28.21 | 75.08 | 6056 | 18 |
| 6.504132 | 30.34 | 59.41 | 38.76 | 89.46 | 6046 | 32 |
| 6.574965 | 36.29 | 73.99 | 73.54 | 128.51 | 6051 | 32 |
| 6.645822 | 35.38 | 90.39 | 79.52 | 143.07 | 6050 | 32 |
| 6.716690 | 33.15 | 56.46 | 66.37 | 108.71 | 6048 | 32 |
| 6.787535 | 34.14 | 50.95 | 43.89 | 91.27 | 6051 | 15 |
| 6.858356 | 30.72 | 51.58 | 39.38 | 85.80 | 6038 | 15 |
| 6.929190 | 36.10 | 47.37 | 46.34 | 89.81 | 6057 | 18 |
| 6.982292 | 43.72 | 46.45 | 33.26 | 81.71 | 3018 | 18 |
| 7.017037 | 27.16 | 53.49 | 27.97 | 76.70 | 2909 | 18 |
| 7.069433 | 40.52 | 65.66 | 43.09 | 101.16 | 6055 | 18 |
| 7.140289 | 35.96 | 63.67 | 37.99 | 93.67 | 6058 | 15 |
| 7.211100 | 33.02 | 50.12 | 21.57 | 71.94 | 6058 | 15 |
| 7.281956 | 31.12 | 43.82 | 16.70 | 63.68 | 6060 | 5 |
| 7.352801 | 25.92 | 45.56 | 22.14 | 65.58 | 6057 | 5 |
| 7.423611 | 26.82 | 46.06 | 27.59 | 71.55 | 6059 | 7 |
| 7.494444 | 31.06 | 49.25 | 24.91 | 73.74 | 6059 | 7 |
| 7.565266 | 33.81 | 48.80 | 20.98 | 72.69 | 6056 | 7 |
| 7.637292 | 31.27 | 49.08 | 27.87 | 74.17 | 5542 | 9 |
| 7.706944 | 34.78 | 49.22 | 35.36 | 80.56 | 6046 | 9 |
| 7.777755 | 32.22 | 46.39 | 36.64 | 78.20 | 6044 | 12 |
| 7.848634 | 31.46 | 56.52 | 36.62 | 86.04 | 6050 | 12 |
| 7.919491 | 32.63 | 41.96 | 37.06 | 76.27 | 6057 | 7 |
| 7.977431 | 35.07 | 53.62 | 28.25 | 79.39 | 3851 | 7 |

| | | | | | | |
|-----------|-------|--------|--------|--------|------|----|
| 8.012153 | 34.60 | 43.11 | 101.41 | 129.63 | 2080 | 7 |
| 8.059711 | 36.67 | 65.99 | 152.11 | 184.67 | 6050 | 7 |
| 8.130556 | 35.22 | 53.63 | 152.50 | 176.95 | 6061 | 3 |
| 8.201366 | 32.38 | 45.46 | 150.48 | 171.17 | 6054 | 3 |
| 8.272199 | 30.22 | 49.38 | 154.46 | 175.42 | 6060 | 5 |
| 8.413889 | 24.67 | 46.99 | 157.97 | 175.88 | 6059 | 6 |
| 8.484722 | 30.64 | 58.44 | 154.80 | 181.72 | 6056 | 6 |
| 8.555532 | 34.66 | 58.91 | 161.54 | 188.53 | 6058 | 6 |
| 8.626412 | 34.75 | 62.10 | 168.30 | 195.30 | 6044 | 9 |
| 8.773160 | 30.50 | 48.08 | 151.43 | 173.82 | 5185 | 3 |
| 8.838912 | 28.50 | 44.68 | 157.54 | 177.41 | 6053 | 3 |
| 8.975081 | 38.87 | 51.22 | 163.37 | 185.95 | 4256 | 0 |
| 9.007303 | 41.10 | 35.15 | 49.27 | 81.85 | 1248 | 5 |
| 9.050058 | 37.36 | 52.60 | 60.00 | 98.18 | 6038 | 5 |
| 9.120833 | 44.12 | 51.07 | 57.43 | 100.57 | 6063 | 5 |
| 9.191725 | 36.80 | 48.51 | 56.33 | 92.62 | 6038 | 5 |
| 9.262477 | 35.28 | 44.21 | 57.36 | 88.61 | 6047 | 0 |
| 9.333391 | 28.24 | 44.73 | 58.76 | 88.06 | 6047 | 0 |
| 9.622569 | 33.94 | 55.20 | 58.53 | 98.17 | 5037 | 2 |
| 9.687500 | 29.72 | 49.71 | 64.51 | 98.54 | 6052 | 2 |
| 9.833519 | 27.71 | 45.72 | 58.82 | 89.19 | 5314 | 2 |
| 9.900046 | 32.71 | 44.02 | 67.12 | 97.50 | 6053 | 6 |
| 9.967731 | 35.78 | 46.54 | 64.96 | 97.30 | 5518 | 6 |
| 10.002442 | 42.79 | 60.41 | 55.34 | 98.06 | 414 | 5 |
| 10.040266 | 39.43 | 59.47 | 148.03 | 176.74 | 6048 | 5 |
| 10.116817 | 47.09 | 67.87 | 133.20 | 172.13 | 5022 | 5 |
| 10.181944 | 38.47 | 54.92 | 146.21 | 174.15 | 6059 | 7 |
| 10.252755 | 35.14 | 55.38 | 142.77 | 168.83 | 6061 | 3 |
| 10.323600 | 29.87 | 61.68 | 144.23 | 171.86 | 6062 | 3 |
| 10.394444 | 28.00 | 53.41 | 146.12 | 169.39 | 6059 | 3 |
| 10.465255 | 28.57 | 59.29 | 146.99 | 174.28 | 6055 | 3 |
| 10.536088 | 30.94 | 61.84 | 153.37 | 179.81 | 6048 | 4 |
| 10.606944 | 32.05 | 61.58 | 157.87 | 183.72 | 6055 | 4 |
| 10.677813 | 28.80 | 54.05 | 158.53 | 180.13 | 6052 | 6 |
| 10.964155 | 39.00 | 60.18 | 159.73 | 190.60 | 5534 | 15 |
| 10.997824 | 21.46 | 78.20 | 138.75 | 162.90 | 223 | 15 |
| 11.136644 | 27.96 | 89.04 | 9.56 | 93.83 | 27 | 9 |
| 11.172211 | 39.37 | 60.50 | 30.95 | 87.61 | 6060 | 9 |
| 11.243009 | 36.10 | 48.00 | 18.75 | 69.67 | 6051 | 9 |
| 11.313866 | 31.35 | 49.82 | 23.68 | 70.99 | 6060 | 6 |
| 11.384722 | 28.08 | 50.85 | 20.46 | 70.06 | 6059 | 9 |
| 11.455556 | 28.72 | 59.41 | 24.61 | 80.04 | 6060 | 9 |
| 11.527072 | 28.42 | 65.84 | 33.65 | 91.26 | 5848 | 22 |
| 11.597222 | 29.70 | 83.94 | 49.65 | 119.16 | 6049 | 22 |
| 11.668021 | 27.78 | 71.51 | 64.66 | 119.82 | 6030 | 22 |
| 11.738866 | 29.39 | 78.39 | 68.60 | 128.23 | 6034 | 22 |
| 11.809757 | 42.10 | 85.99 | 103.36 | 164.68 | 6048 | 56 |
| 11.880509 | 42.42 | 89.26 | 73.88 | 146.98 | 6036 | 56 |
| 11.951447 | 49.83 | 102.54 | 84.65 | 161.02 | 6040 | 56 |
| 11.993403 | 54.61 | 78.45 | 57.28 | 138.14 | 1124 | 56 |
| 12.028125 | 49.78 | 80.67 | 45.94 | 119.82 | 4799 | 22 |
| 12.091690 | 56.85 | 80.43 | 66.14 | 133.23 | 6049 | 22 |
| 12.162488 | 52.20 | 69.45 | 53.98 | 115.92 | 6058 | 15 |
| 12.233287 | 49.29 | 68.83 | 57.95 | 115.55 | 6053 | 15 |
| 12.304167 | 40.16 | 58.78 | 51.87 | 99.38 | 6051 | 12 |
| 12.375012 | 36.37 | 48.39 | 49.16 | 88.96 | 6061 | 7 |
| 12.445845 | 33.06 | 53.33 | 48.62 | 90.83 | 6062 | 7 |
| 12.516644 | 34.82 | 58.86 | 52.31 | 98.45 | 6052 | 4 |
| 12.663171 | 25.36 | 43.17 | 53.23 | 84.29 | 4480 | 7 |
| 12.729178 | 31.84 | 55.70 | 64.05 | 107.08 | 6049 | 7 |
| 12.800035 | 34.06 | 53.55 | 68.72 | 109.28 | 6041 | 9 |
| 12.871863 | 33.59 | 54.09 | 63.25 | 104.73 | 5817 | 9 |
| 12.941690 | 41.79 | 55.80 | 60.53 | 106.37 | 6057 | 7 |
| 12.988542 | 56.66 | 53.16 | 76.63 | 126.79 | 1958 | 7 |
| 13.023310 | 40.90 | 64.97 | 30.03 | 92.40 | 3970 | 7 |
| 13.081933 | 51.28 | 55.24 | 34.65 | 94.23 | 6057 | 7 |
| 13.152778 | 51.36 | 52.30 | 33.13 | 91.66 | 6066 | 9 |
| 13.223588 | 44.19 | 58.59 | 20.70 | 85.90 | 6054 | 9 |
| 13.294433 | 38.50 | 57.98 | 20.51 | 81.43 | 6061 | 9 |
| 13.365278 | 33.81 | 52.51 | 31.90 | 81.47 | 6061 | 9 |
| 13.436111 | 34.43 | 54.21 | 26.59 | 79.78 | 6059 | 15 |

| | | | | | | |
|-----------|-------|-------|--------|--------|------|----|
| 13.506296 | 31.63 | 52.10 | 33.46 | 82.34 | 5854 | 9 |
| 13.577975 | 31.31 | 57.49 | 29.74 | 83.60 | 5996 | 9 |
| 13.648588 | 29.99 | 60.05 | 26.07 | 82.24 | 6002 | 12 |
| 13.719664 | 28.37 | 52.06 | 31.70 | 76.66 | 6001 | 12 |
| 13.790289 | 31.21 | 50.16 | 32.68 | 78.04 | 6052 | 4 |
| 13.861111 | 28.48 | 45.47 | 34.56 | 76.44 | 6043 | 4 |
| 13.922014 | 37.37 | 53.60 | 47.24 | 95.85 | 4355 | 6 |
| 13.985567 | 46.21 | 45.33 | 27.99 | 81.89 | 2463 | 6 |
| 14.018449 | 30.17 | 81.06 | 55.52 | 114.56 | 3140 | 15 |
| 14.072234 | 39.56 | 52.96 | 66.32 | 106.96 | 6054 | 15 |
| 14.143056 | 36.22 | 55.68 | 63.40 | 103.10 | 6064 | 9 |
| 14.213877 | 33.97 | 50.33 | 58.70 | 95.77 | 6053 | 9 |
| 14.284722 | 31.65 | 42.00 | 58.46 | 87.60 | 6064 | 4 |
| 14.355556 | 25.60 | 45.69 | 61.38 | 88.80 | 6060 | 4 |
| 14.426389 | 23.45 | 49.95 | 60.75 | 91.90 | 6060 | 3 |
| 14.497222 | 28.47 | 57.52 | 65.20 | 103.83 | 6058 | 3 |
| 14.568009 | 32.13 | 61.21 | 67.91 | 109.46 | 6047 | 6 |
| 14.855405 | 27.32 | 47.83 | 70.34 | 103.13 | 5374 | 9 |
| 14.891273 | 27.82 | 47.69 | 93.88 | 120.62 | 758 | 6 |
| 15.035949 | 16.83 | 87.98 | 67.43 | 113.47 | 155 | 7 |
| 15.133310 | 36.64 | 58.81 | 73.09 | 113.81 | 6053 | 7 |
| 15.204167 | 34.05 | 60.96 | 73.69 | 112.25 | 6061 | 7 |
| 15.275012 | 31.29 | 50.40 | 69.29 | 101.89 | 6055 | 5 |
| 15.345845 | 25.63 | 40.87 | 69.71 | 93.11 | 6057 | 5 |
| 15.416667 | 24.19 | 39.32 | 71.92 | 93.90 | 6057 | 3 |
| 15.487500 | 27.36 | 57.77 | 75.12 | 109.85 | 6058 | 3 |
| 15.558310 | 32.15 | 53.37 | 74.87 | 108.96 | 6055 | 7 |
| 15.629155 | 30.97 | 52.65 | 83.92 | 114.89 | 6057 | 5 |
| 15.670764 | 26.10 | 45.01 | 117.19 | 134.68 | 1048 | 5 |
| 16.008692 | 29.22 | 48.22 | 138.65 | 161.25 | 1486 | 5 |
| 16.052778 | 37.86 | 72.20 | 165.17 | 203.82 | 6053 | 5 |
| 16.123611 | 41.49 | 59.12 | 171.14 | 199.89 | 6055 | 5 |
| 16.265289 | 33.22 | 51.93 | 160.45 | 182.75 | 6063 | 5 |
| 16.336111 | 26.23 | 59.18 | 162.47 | 187.40 | 6054 | 5 |
| 16.406944 | 25.99 | 48.72 | 164.95 | 182.60 | 6054 | 5 |
| 16.624954 | 33.24 | 55.82 | 168.19 | 190.83 | 5104 | 6 |
| 16.765881 | 27.87 | 50.75 | 169.63 | 190.21 | 5242 | 6 |
| 16.831932 | 27.10 | 44.64 | 177.92 | 195.89 | 6046 | 6 |
| 16.902788 | 29.92 | 50.64 | 181.48 | 203.05 | 6056 | 7 |
| 16.969120 | 35.59 | 64.89 | 181.42 | 210.24 | 5277 | 7 |
| 17.003832 | 40.30 | 55.65 | 56.95 | 96.67 | 651 | 5 |
| 17.113876 | 42.10 | 57.57 | 94.13 | 130.46 | 6055 | 5 |
| 17.184711 | 38.73 | 50.90 | 96.07 | 127.23 | 6057 | 2 |
| 17.255545 | 35.36 | 59.06 | 96.04 | 130.73 | 6063 | 4 |
| 17.397234 | 26.54 | 48.97 | 94.80 | 120.57 | 6053 | 2 |
| 17.468067 | 27.61 | 54.06 | 94.96 | 124.09 | 6052 | 2 |
| 17.538866 | 30.98 | 53.69 | 100.05 | 128.77 | 6056 | 3 |
| 17.609699 | 31.64 | 55.93 | 101.56 | 131.54 | 6046 | 3 |
| 17.680567 | 29.37 | 49.99 | 98.68 | 126.40 | 6056 | 2 |
| 17.751411 | 27.45 | 46.65 | 99.26 | 123.74 | 6051 | 3 |
| 17.822256 | 26.72 | 44.90 | 93.49 | 117.39 | 6053 | 3 |
| 17.893103 | 28.41 | 43.62 | 101.57 | 124.62 | 6058 | 0 |
| 17.963900 | 34.64 | 49.09 | 90.74 | 119.59 | 6050 | 0 |
| 17.999641 | 21.10 | 76.81 | 29.61 | 85.47 | 59 | 0 |
| 18.005360 | 16.25 | 80.64 | 68.05 | 108.33 | 169 | 2 |
| 18.104155 | 46.30 | 60.17 | 88.12 | 131.01 | 6055 | 2 |
| 18.174988 | 42.49 | 59.55 | 113.03 | 147.33 | 6059 | 2 |
| 18.245810 | 40.15 | 64.44 | 97.38 | 138.51 | 6059 | 2 |
| 18.316668 | 32.54 | 57.36 | 99.19 | 132.52 | 6059 | 3 |
| 18.458309 | 30.90 | 56.11 | 101.18 | 132.32 | 6053 | 3 |
| 18.522280 | 32.69 | 58.08 | 96.08 | 128.53 | 4873 | 4 |
| 18.605591 | 32.03 | 63.14 | 105.78 | 138.75 | 5094 | 4 |
| 18.670834 | 29.62 | 52.78 | 110.11 | 138.73 | 6054 | 5 |
| 18.741690 | 25.25 | 44.88 | 108.01 | 131.13 | 6052 | 5 |
| 18.812511 | 28.90 | 43.27 | 104.18 | 129.92 | 6050 | 3 |
| 18.883345 | 34.91 | 43.35 | 110.62 | 135.91 | 6052 | 3 |
| 18.954189 | 41.97 | 47.75 | 112.57 | 142.12 | 6055 | 3 |
| 18.994757 | 28.33 | 40.73 | 168.84 | 181.00 | 875 | 3 |
| 19.029398 | 47.64 | 50.57 | 37.98 | 89.89 | 4964 | 3 |
| 19.094433 | 46.17 | 57.85 | 51.90 | 103.12 | 6052 | 3 |
| 19.165277 | 42.65 | 50.78 | 48.25 | 91.53 | 6064 | 2 |

| | | | | | | |
|-----------|-------|--------|--------|--------|------|----|
| 19.307026 | 33.91 | 44.59 | 44.73 | 81.87 | 6042 | 3 |
| 19.377777 | 31.22 | 42.47 | 51.37 | 83.87 | 6056 | 2 |
| 19.448587 | 30.16 | 46.79 | 51.32 | 86.22 | 6054 | 2 |
| 19.519421 | 33.76 | 50.28 | 50.68 | 89.64 | 6049 | 3 |
| 19.590256 | 31.57 | 49.71 | 52.79 | 90.96 | 6048 | 3 |
| 19.661089 | 29.73 | 51.16 | 55.24 | 93.85 | 6043 | 5 |
| 19.731979 | 26.29 | 48.39 | 56.66 | 91.91 | 6048 | 5 |
| 19.802801 | 29.01 | 43.25 | 60.76 | 90.99 | 6049 | 7 |
| 19.873623 | 35.24 | 46.50 | 79.82 | 114.58 | 6056 | 7 |
| 19.944456 | 42.65 | 57.78 | 70.15 | 117.18 | 6052 | 15 |
| 19.989931 | 57.76 | 56.55 | 80.38 | 132.77 | 1721 | 15 |
| 20.024689 | 40.36 | 50.71 | 44.86 | 89.27 | 4205 | 9 |
| 20.084700 | 45.46 | 49.76 | 51.40 | 96.83 | 6050 | 9 |
| 20.226366 | 38.99 | 57.97 | 54.38 | 98.29 | 6055 | 6 |
| 20.297222 | 35.04 | 55.18 | 49.58 | 92.60 | 6064 | 9 |
| 20.368067 | 29.77 | 59.78 | 61.53 | 102.70 | 6057 | 9 |
| 20.438889 | 32.38 | 56.32 | 52.33 | 94.28 | 6055 | 7 |
| 20.509699 | 35.39 | 54.70 | 74.56 | 110.83 | 6054 | 15 |
| 20.580532 | 33.40 | 58.88 | 62.83 | 106.21 | 6055 | 15 |
| 20.651354 | 31.68 | 52.78 | 53.94 | 93.45 | 6043 | 9 |
| 20.722212 | 27.72 | 53.68 | 49.81 | 91.48 | 6048 | 9 |
| 20.793068 | 31.19 | 53.90 | 64.70 | 106.14 | 6048 | 22 |
| 20.867603 | 36.37 | 49.77 | 65.76 | 104.03 | 5406 | 22 |
| 20.934723 | 41.42 | 43.36 | 50.38 | 91.02 | 6053 | 6 |
| 20.985058 | 50.43 | 49.26 | 77.78 | 120.82 | 2553 | 6 |
| 21.019827 | 38.72 | 39.64 | 72.68 | 100.94 | 3380 | 3 |
| 21.074987 | 45.01 | 50.24 | 100.85 | 133.42 | 6057 | 3 |
| 21.145832 | 42.96 | 48.79 | 95.00 | 127.69 | 6061 | 0 |
| 21.216656 | 41.70 | 49.91 | 93.61 | 125.65 | 6057 | 0 |
| 21.358322 | 33.03 | 47.32 | 97.11 | 123.08 | 6054 | 0 |
| 21.429155 | 32.61 | 46.44 | 96.18 | 122.78 | 6056 | 2 |
| 21.576551 | 35.18 | 51.86 | 94.26 | 124.25 | 5066 | 3 |
| 21.641666 | 32.17 | 48.68 | 109.86 | 135.06 | 6050 | 2 |
| 21.712500 | 29.16 | 43.67 | 104.67 | 128.27 | 6048 | 2 |
| 21.783333 | 29.90 | 40.64 | 97.46 | 120.53 | 6047 | 0 |
| 21.854214 | 31.86 | 39.41 | 98.56 | 121.80 | 6049 | 0 |
| 21.924999 | 38.66 | 38.85 | 99.79 | 124.97 | 6051 | 2 |
| 21.980207 | 46.46 | 44.15 | 109.21 | 139.56 | 3374 | 2 |
| 22.014919 | 37.06 | 34.56 | 46.87 | 77.22 | 2548 | 5 |
| 22.136110 | 42.19 | 49.97 | 46.59 | 91.06 | 6060 | 9 |
| 22.206921 | 38.08 | 56.07 | 49.67 | 92.87 | 6058 | 9 |
| 22.277765 | 36.09 | 85.02 | 69.52 | 127.71 | 6061 | 9 |
| 22.348635 | 28.59 | 72.99 | 48.84 | 103.62 | 6055 | 9 |
| 22.419443 | 29.94 | 55.93 | 63.17 | 100.08 | 6055 | 15 |
| 22.490267 | 32.85 | 55.26 | 61.75 | 100.04 | 6053 | 15 |
| 22.561066 | 34.41 | 65.18 | 66.89 | 114.04 | 6052 | 18 |
| 22.631933 | 33.37 | 56.46 | 90.75 | 125.47 | 6052 | 18 |
| 22.702789 | 30.45 | 54.89 | 67.08 | 105.34 | 6054 | 18 |
| 22.773645 | 33.80 | 77.29 | 74.66 | 126.65 | 6043 | 56 |
| 22.844456 | 41.91 | 100.75 | 106.67 | 170.01 | 6041 | 56 |
| 22.915300 | 53.36 | 99.46 | 84.89 | 159.37 | 6054 | 48 |
| 22.975325 | 72.30 | 78.30 | 84.21 | 157.86 | 4203 | 48 |
| 23.010080 | 25.93 | 114.59 | 88.43 | 165.48 | 1722 | 94 |
| 23.055532 | 63.76 | 111.43 | 107.28 | 189.94 | 6047 | 94 |
| 23.126377 | 66.81 | 134.70 | 120.29 | 217.41 | 6046 | 67 |
| 23.197210 | 53.25 | 75.38 | 70.93 | 131.57 | 6055 | 67 |
| 23.268057 | 48.83 | 62.61 | 72.28 | 119.50 | 6064 | 7 |
| 23.338877 | 41.81 | 59.69 | 73.85 | 115.52 | 6055 | 7 |
| 23.409712 | 41.97 | 66.41 | 71.12 | 119.96 | 6059 | 22 |
| 23.557199 | 45.17 | 73.78 | 76.29 | 129.54 | 5057 | 22 |
| 23.622198 | 38.13 | 73.07 | 83.83 | 135.23 | 6049 | 22 |
| 23.693068 | 40.36 | 63.35 | 80.62 | 124.88 | 6056 | 12 |
| 23.734375 | 33.57 | 64.72 | 87.22 | 128.95 | 1003 | 12 |
| 24.005220 | 40.77 | 64.57 | 54.55 | 99.56 | 889 | 6 |
| 24.045788 | 50.55 | 64.74 | 64.03 | 120.87 | 6039 | 6 |
| 24.116644 | 57.57 | 70.12 | 63.89 | 127.79 | 6048 | 6 |
| 24.327326 | 34.83 | 70.03 | 66.07 | 116.02 | 5514 | 27 |
| 24.547512 | 34.00 | 56.28 | 73.64 | 110.94 | 5050 | 9 |
| 24.612499 | 36.74 | 68.10 | 83.84 | 130.12 | 6056 | 9 |
| 24.683380 | 33.32 | 69.42 | 88.98 | 131.40 | 6045 | 9 |
| 24.754469 | 29.74 | 61.30 | 79.60 | 120.43 | 5946 | 9 |

| | | | | | | |
|-----------|-------|--------|-------|--------|------|----|
| 24.825047 | 32.83 | 60.70 | 78.02 | 119.32 | 6053 | 9 |
| 24.895868 | 37.06 | 54.40 | 80.75 | 120.30 | 6062 | 15 |
| 24.965660 | 46.27 | 66.51 | 79.45 | 129.31 | 5874 | 15 |
| 25.000717 | 33.35 | 111.15 | 18.25 | 117.67 | 117 | 7 |
| 25.036818 | 42.86 | 62.98 | 53.02 | 107.58 | 6048 | 7 |
| 25.107651 | 48.67 | 68.13 | 62.53 | 119.10 | 6055 | 7 |
| 25.249306 | 37.70 | 80.55 | 64.81 | 126.40 | 6057 | 12 |
| 25.320139 | 29.95 | 79.93 | 66.15 | 122.35 | 6061 | 7 |
| 25.390972 | 29.97 | 72.56 | 67.14 | 114.69 | 6056 | 5 |
| 25.461817 | 33.11 | 59.94 | 55.03 | 99.23 | 6052 | 5 |
| 25.532661 | 31.83 | 59.03 | 59.65 | 102.15 | 6051 | 4 |
| 25.603472 | 32.92 | 56.20 | 56.80 | 99.87 | 6050 | 4 |
| 25.674330 | 31.82 | 51.10 | 55.87 | 95.40 | 6053 | 5 |
| 25.745150 | 27.59 | 50.48 | 60.02 | 99.70 | 6041 | 5 |
| 25.815985 | 31.27 | 49.00 | 73.42 | 106.33 | 6056 | 9 |
| 25.888531 | 34.17 | 42.15 | 61.36 | 96.11 | 5727 | 6 |
| 25.957663 | 39.44 | 47.91 | 55.91 | 98.39 | 6057 | 6 |
| 25.996529 | 22.80 | 43.71 | 91.98 | 113.10 | 593 | 6 |
| 26.030926 | 45.86 | 52.25 | 53.20 | 102.39 | 5275 | 7 |
| 26.097221 | 47.48 | 60.26 | 57.67 | 109.25 | 6047 | 7 |
| 26.238890 | 38.89 | 72.56 | 64.00 | 118.70 | 6051 | 15 |
| 26.309711 | 31.39 | 51.39 | 50.51 | 87.99 | 6046 | 7 |
| 26.380568 | 31.36 | 47.30 | 52.80 | 86.92 | 6058 | 5 |
| 26.451378 | 30.54 | 45.63 | 52.09 | 85.85 | 6053 | 5 |
| 26.522245 | 30.07 | 55.81 | 60.75 | 99.46 | 6047 | 4 |
| 26.593044 | 32.93 | 50.26 | 48.44 | 88.03 | 6053 | 4 |
| 26.663935 | 29.30 | 48.05 | 58.31 | 93.62 | 6041 | 4 |
| 26.734734 | 27.36 | 44.40 | 53.28 | 87.06 | 6047 | 4 |
| 26.805601 | 29.17 | 39.86 | 50.82 | 84.06 | 6050 | 5 |
| 26.876400 | 32.08 | 46.63 | 65.34 | 102.26 | 6054 | 15 |
| 26.947256 | 42.87 | 63.71 | 67.27 | 119.53 | 6057 | 15 |
| 26.991343 | 56.53 | 43.73 | 85.56 | 132.41 | 1485 | 15 |
| 27.026075 | 40.12 | 67.46 | 53.11 | 108.49 | 4444 | 18 |
| 27.087477 | 44.42 | 54.19 | 27.87 | 86.02 | 6051 | 18 |
| 27.158321 | 42.05 | 53.15 | 26.56 | 82.09 | 6059 | 9 |
| 27.229155 | 39.48 | 56.77 | 23.43 | 81.00 | 6055 | 9 |
| 27.300013 | 32.02 | 66.96 | 26.04 | 87.14 | 6062 | 6 |
| 27.370810 | 27.79 | 51.18 | 24.57 | 70.49 | 6058 | 6 |
| 27.441586 | 29.25 | 54.90 | 40.40 | 84.55 | 6038 | 7 |
| 27.512501 | 27.98 | 62.55 | 27.45 | 82.33 | 6049 | 15 |
| 27.583332 | 30.06 | 53.48 | 28.81 | 77.10 | 6055 | 15 |
| 27.654156 | 27.81 | 70.98 | 40.77 | 96.65 | 6034 | 15 |
| 27.725080 | 25.47 | 59.46 | 44.93 | 91.68 | 6015 | 15 |
| 27.795868 | 27.69 | 64.09 | 64.78 | 111.86 | 6034 | 32 |
| 27.866713 | 31.48 | 67.17 | 60.91 | 108.90 | 6049 | 32 |
| 27.937511 | 39.08 | 76.91 | 59.90 | 121.98 | 6027 | 32 |
| 27.986435 | 50.26 | 95.13 | 73.72 | 151.08 | 2302 | 32 |
| 28.021563 | 37.53 | 48.31 | 57.43 | 99.14 | 3664 | 48 |
| 28.078461 | 48.17 | 77.12 | 48.90 | 114.74 | 6052 | 48 |
| 28.149305 | 45.44 | 58.82 | 37.48 | 93.03 | 6064 | 48 |
| 28.220127 | 37.40 | 89.54 | 57.15 | 126.80 | 6056 | 48 |
| 28.290972 | 34.06 | 65.30 | 31.54 | 91.19 | 6054 | 32 |
| 28.361807 | 29.37 | 66.30 | 55.05 | 103.63 | 6062 | 32 |
| 28.432638 | 32.12 | 51.66 | 37.86 | 82.84 | 6058 | 22 |
| 28.503471 | 36.05 | 62.37 | 59.62 | 104.33 | 6050 | 32 |
| 28.574293 | 37.69 | 59.44 | 44.24 | 94.32 | 6050 | 32 |
| 28.645126 | 34.24 | 62.28 | 41.51 | 95.62 | 6056 | 22 |
| 28.715984 | 30.94 | 61.70 | 51.45 | 99.87 | 6041 | 22 |
| 28.786829 | 31.30 | 42.91 | 40.44 | 78.42 | 6050 | 18 |
| 28.857651 | 30.42 | 49.32 | 34.67 | 78.25 | 6043 | 18 |
| 28.928495 | 40.00 | 63.30 | 59.85 | 109.48 | 6055 | 32 |
| 28.981920 | 57.19 | 64.16 | 84.28 | 134.20 | 3078 | 32 |
| 29.016689 | 39.23 | 62.72 | 76.31 | 117.35 | 2849 | 32 |
| 29.068739 | 49.86 | 71.49 | 46.24 | 110.86 | 6054 | 32 |
| 29.139584 | 44.02 | 56.91 | 30.83 | 89.15 | 6058 | 27 |
| 29.210417 | 43.11 | 59.05 | 41.85 | 96.36 | 6061 | 27 |
| 29.281250 | 35.75 | 56.63 | 28.26 | 83.97 | 6060 | 32 |
| 29.352106 | 27.17 | 62.25 | 55.64 | 104.09 | 6056 | 32 |
| 29.422928 | 32.86 | 57.80 | 40.79 | 88.73 | 6050 | 27 |
| 29.493715 | 35.15 | 60.33 | 70.23 | 108.59 | 6047 | 27 |
| 29.564571 | 35.83 | 61.35 | 70.65 | 111.22 | 6048 | 32 |

| | | | | | | |
|-----------|-------|-------|--------|--------|------|----|
| 29.635405 | 32.49 | 59.05 | 54.37 | 98.15 | 6055 | 39 |
| 29.706263 | 37.73 | 87.18 | 75.51 | 134.61 | 6047 | 39 |
| 29.777130 | 34.51 | 59.21 | 50.93 | 100.04 | 6048 | 32 |
| 29.853924 | 22.06 | 41.18 | 32.96 | 67.15 | 4411 | 32 |
| 29.918797 | 37.58 | 47.87 | 34.73 | 81.55 | 6052 | 22 |
| 29.977060 | 48.74 | 49.48 | 53.63 | 102.24 | 3906 | 22 |
| 30.011793 | 36.53 | 64.62 | 57.89 | 107.09 | 2017 | 12 |
| 30.059029 | 43.51 | 54.32 | 48.90 | 97.83 | 6055 | 12 |
| 30.129839 | 45.32 | 47.91 | 56.46 | 98.17 | 6051 | 12 |
| 30.200684 | 39.61 | 67.42 | 60.61 | 112.29 | 6058 | 12 |
| 30.271517 | 36.17 | 49.79 | 56.45 | 93.42 | 6061 | 18 |
| 30.413195 | 30.53 | 50.10 | 53.28 | 89.70 | 6057 | 7 |
| 30.483994 | 32.14 | 50.94 | 48.71 | 90.11 | 6044 | 7 |
| 30.554873 | 34.18 | 54.18 | 66.85 | 106.49 | 6047 | 18 |
| 30.625683 | 34.17 | 52.82 | 58.74 | 100.64 | 6057 | 15 |
| 30.696564 | 32.16 | 46.67 | 57.59 | 97.41 | 6050 | 15 |
| 30.767466 | 30.35 | 57.19 | 66.09 | 108.31 | 6035 | 22 |
| 30.838228 | 32.11 | 66.47 | 83.82 | 125.93 | 6046 | 22 |
| 30.909098 | 40.38 | 50.53 | 63.27 | 106.74 | 6050 | 15 |
| 30.972269 | 44.93 | 50.76 | 55.90 | 101.30 | 4734 | 15 |
| 31.006922 | 31.29 | 45.19 | 70.71 | 100.59 | 1182 | 18 |
| 31.049307 | 45.66 | 61.36 | 100.27 | 142.48 | 6050 | 18 |
| 31.120127 | 49.19 | 61.41 | 109.68 | 150.63 | 6061 | 18 |
| 31.190985 | 41.79 | 52.18 | 98.02 | 129.50 | 6063 | 9 |
| 31.332640 | 32.66 | 53.93 | 104.05 | 133.22 | 6056 | 12 |
| 31.403473 | 33.06 | 51.29 | 99.83 | 127.56 | 6056 | 9 |
| 31.474295 | 32.70 | 52.76 | 95.75 | 126.81 | 6055 | 9 |
| 31.545103 | 34.33 | 54.98 | 97.01 | 129.76 | 6044 | 9 |
| 31.615961 | 35.04 | 51.97 | 109.34 | 141.06 | 6057 | 9 |
| 31.686794 | 32.05 | 46.40 | 111.64 | 137.93 | 6049 | 12 |
| 31.832441 | 35.02 | 43.19 | 93.05 | 121.02 | 5366 | 7 |
| 31.899328 | 36.63 | 43.22 | 102.80 | 128.70 | 6059 | 7 |
| 31.967384 | 43.40 | 45.71 | 105.21 | 134.16 | 5578 | 7 |
| 32.002094 | 45.27 | 67.89 | 14.11 | 83.62 | 353 | 9 |
| 32.039597 | 43.93 | 48.27 | 50.75 | 94.08 | 6051 | 9 |
| 32.110405 | 47.04 | 50.16 | 48.14 | 94.45 | 6056 | 9 |
| 32.181252 | 42.82 | 50.04 | 53.36 | 94.17 | 6061 | 5 |
| 32.252060 | 39.54 | 56.94 | 53.26 | 96.46 | 6055 | 7 |
| 32.322918 | 32.32 | 49.95 | 52.98 | 89.20 | 6059 | 7 |
| 32.393749 | 31.52 | 44.16 | 54.41 | 85.96 | 6049 | 3 |
| 32.464573 | 32.22 | 43.48 | 47.08 | 82.84 | 6058 | 3 |
| 32.535416 | 34.47 | 62.44 | 54.88 | 101.86 | 6042 | 15 |
| 32.606228 | 36.84 | 53.51 | 61.32 | 103.81 | 6048 | 15 |
| 32.752766 | 30.50 | 47.31 | 58.11 | 93.51 | 5226 | 9 |
| 32.818764 | 31.16 | 45.41 | 52.39 | 89.54 | 6051 | 9 |
| 32.889606 | 35.17 | 39.67 | 56.56 | 90.51 | 6059 | 12 |
| 32.960442 | 41.84 | 45.32 | 56.37 | 96.58 | 6043 | 12 |
| 32.997906 | 28.81 | 61.83 | 56.11 | 95.78 | 355 | 12 |
| 33.032661 | 49.29 | 57.40 | 24.93 | 89.70 | 5572 | 9 |
| 33.100704 | 47.52 | 49.30 | 22.40 | 80.99 | 6049 | 9 |
| 33.171551 | 44.73 | 46.97 | 27.33 | 78.90 | 6062 | 5 |
| 33.242359 | 39.10 | 45.08 | 15.44 | 66.73 | 6056 | 5 |
| 33.313183 | 35.73 | 42.73 | 16.73 | 64.19 | 6058 | 3 |
| 33.384041 | 32.08 | 43.27 | 18.28 | 64.66 | 6056 | 6 |
| 33.454849 | 33.19 | 46.57 | 22.23 | 70.15 | 6061 | 6 |
| 33.525696 | 36.53 | 51.03 | 41.94 | 86.43 | 6048 | 12 |
| 33.596516 | 33.99 | 54.10 | 27.73 | 79.60 | 6057 | 12 |
| 33.667362 | 34.85 | 58.51 | 50.72 | 96.86 | 6052 | 18 |
| 33.738216 | 30.48 | 53.05 | 48.34 | 86.12 | 6053 | 18 |
| 33.809052 | 31.45 | 47.32 | 24.22 | 73.66 | 6056 | 7 |
| 33.879860 | 35.20 | 44.05 | 27.38 | 74.21 | 6055 | 7 |
| 33.950706 | 42.85 | 42.23 | 23.01 | 73.17 | 6051 | 7 |
| 33.993103 | 41.09 | 39.41 | 13.69 | 65.84 | 1168 | 7 |
| 34.027882 | 42.52 | 49.77 | 45.24 | 89.87 | 4694 | 4 |
| 34.090961 | 47.20 | 52.43 | 47.62 | 96.32 | 6052 | 4 |
| 34.222605 | 39.86 | 55.14 | 52.55 | 96.94 | 6054 | 4 |
| 34.303471 | 34.41 | 59.50 | 53.99 | 98.78 | 6058 | 9 |
| 34.374317 | 32.59 | 46.08 | 48.38 | 83.29 | 6058 | 9 |
| 34.445141 | 33.71 | 53.10 | 53.96 | 94.48 | 6056 | 5 |
| 34.515972 | 33.96 | 55.74 | 45.77 | 90.04 | 6051 | 15 |
| 34.586758 | 37.67 | 65.84 | 62.61 | 111.73 | 6047 | 15 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 34.657616 | 33.15 | 48.46 | 62.85 | 98.28 | 6051 | 12 |
| 34.728497 | 28.35 | 48.80 | 55.44 | 91.48 | 6043 | 12 |
| 34.799328 | 30.60 | 42.56 | 60.16 | 93.11 | 6049 | 12 |
| 34.870152 | 35.81 | 51.57 | 67.50 | 107.72 | 6057 | 12 |
| 34.940289 | 43.45 | 52.55 | 61.99 | 106.95 | 5781 | 22 |
| 34.988228 | 51.14 | 54.93 | 66.80 | 117.73 | 2002 | 22 |
| 35.022976 | 31.29 | 46.46 | 32.01 | 76.03 | 3910 | 7 |
| 35.081249 | 39.73 | 57.93 | 29.51 | 86.46 | 6055 | 7 |
| 35.152107 | 37.95 | 47.00 | 17.55 | 70.67 | 6059 | 5 |
| 35.222904 | 34.85 | 51.57 | 21.08 | 70.90 | 6056 | 5 |
| 35.293762 | 30.68 | 52.61 | 21.71 | 71.48 | 6062 | 7 |
| 35.364582 | 28.02 | 41.09 | 16.87 | 58.23 | 6058 | 7 |
| 35.511967 | 28.39 | 43.20 | 25.76 | 66.31 | 5077 | 4 |
| 35.577072 | 33.48 | 45.97 | 26.86 | 71.05 | 6058 | 4 |
| 35.647896 | 31.47 | 49.46 | 26.89 | 73.10 | 6049 | 4 |
| 35.718750 | 29.14 | 46.68 | 23.69 | 69.01 | 6048 | 4 |
| 35.789604 | 26.30 | 50.52 | 28.53 | 72.48 | 6054 | 3 |
| 35.860462 | 28.20 | 44.17 | 17.77 | 63.14 | 6051 | 3 |
| 35.931229 | 34.63 | 47.04 | 31.97 | 78.05 | 6046 | 7 |
| 35.983322 | 45.59 | 50.26 | 18.52 | 81.82 | 2843 | 7 |
| 36.018089 | 28.51 | 40.48 | 23.91 | 62.98 | 3085 | 4 |
| 36.071514 | 38.26 | 53.55 | 30.43 | 82.81 | 6053 | 4 |
| 36.142384 | 35.22 | 53.20 | 24.76 | 76.98 | 6056 | 2 |
| 36.213184 | 34.46 | 49.74 | 13.07 | 66.51 | 6057 | 2 |
| 36.284027 | 31.74 | 42.56 | 13.74 | 59.69 | 6061 | 2 |
| 36.354851 | 27.01 | 43.14 | 18.03 | 59.73 | 6057 | 2 |
| 36.425694 | 27.04 | 45.71 | 21.21 | 64.80 | 6058 | 4 |
| 36.496517 | 28.23 | 46.25 | 29.96 | 70.33 | 6054 | 4 |
| 36.567371 | 33.40 | 47.07 | 28.89 | 73.45 | 6047 | 4 |
| 36.638184 | 33.15 | 47.03 | 28.20 | 73.74 | 6058 | 15 |
| 36.709049 | 27.31 | 52.75 | 33.01 | 77.61 | 6055 | 15 |
| 36.779873 | 28.93 | 66.69 | 78.00 | 120.18 | 6049 | 32 |
| 36.850742 | 36.19 | 86.71 | 90.93 | 153.32 | 6041 | 32 |
| 36.921562 | 38.11 | 66.14 | 63.71 | 121.34 | 6053 | 32 |
| 36.978462 | 40.74 | 49.38 | 33.60 | 85.80 | 3672 | 32 |
| 37.013229 | 31.08 | 73.97 | 50.38 | 110.70 | 2249 | 39 |
| 37.061794 | 42.48 | 81.28 | 58.68 | 125.22 | 6053 | 39 |
| 37.132648 | 44.94 | 79.63 | 50.22 | 119.49 | 6055 | 48 |
| 37.203472 | 40.30 | 88.34 | 46.92 | 121.05 | 6053 | 48 |
| 37.274296 | 31.88 | 57.31 | 30.55 | 81.07 | 6063 | 22 |
| 37.345150 | 30.66 | 49.49 | 31.05 | 76.64 | 6052 | 22 |
| 37.415985 | 30.18 | 53.61 | 37.43 | 82.63 | 6056 | 32 |
| 37.486794 | 33.38 | 60.68 | 51.47 | 97.77 | 6051 | 32 |
| 37.557606 | 32.85 | 57.32 | 26.71 | 82.11 | 6043 | 27 |
| 37.628471 | 35.07 | 70.59 | 46.23 | 103.66 | 6054 | 18 |
| 37.699329 | 37.15 | 85.94 | 73.42 | 133.02 | 6045 | 18 |
| 37.770126 | 33.28 | 77.62 | 68.06 | 124.88 | 6039 | 39 |
| 37.841007 | 32.47 | 70.23 | 69.83 | 122.59 | 6053 | 39 |
| 37.911854 | 36.59 | 57.89 | 47.81 | 99.31 | 6051 | 48 |
| 37.973564 | 53.93 | 81.89 | 64.61 | 134.29 | 4490 | 48 |
| 38.008347 | 29.10 | 59.10 | 52.65 | 100.51 | 1424 | 56 |
| 38.052082 | 48.91 | 67.38 | 76.44 | 129.29 | 6051 | 56 |
| 38.122929 | 46.21 | 63.41 | 40.60 | 101.80 | 6050 | 56 |
| 38.193764 | 43.97 | 51.28 | 33.02 | 85.45 | 6055 | 22 |
| 38.264561 | 37.53 | 49.93 | 31.37 | 77.41 | 6055 | 22 |
| 38.335419 | 31.15 | 60.09 | 40.09 | 91.68 | 6053 | 22 |
| 38.406239 | 31.51 | 47.68 | 39.50 | 80.36 | 6053 | 27 |
| 38.477074 | 31.07 | 46.24 | 27.24 | 73.29 | 6048 | 27 |
| 38.547882 | 38.84 | 79.21 | 43.00 | 110.38 | 6046 | 39 |
| 38.618713 | 38.05 | 76.37 | 89.89 | 136.04 | 6045 | 39 |
| 38.689617 | 37.60 | 75.72 | 61.06 | 119.29 | 6043 | 27 |
| 38.760441 | 34.29 | 65.05 | 63.55 | 110.04 | 6046 | 27 |
| 38.831272 | 34.14 | 64.26 | 54.35 | 105.50 | 6055 | 27 |
| 38.902073 | 40.17 | 51.95 | 45.44 | 92.70 | 6049 | 27 |
| 38.968773 | 43.85 | 52.64 | 41.19 | 93.31 | 5339 | 27 |
| 39.003483 | 40.04 | 76.66 | 4.85 | 87.14 | 593 | 22 |
| 39.042339 | 48.95 | 65.02 | 57.81 | 114.03 | 6041 | 22 |
| 39.113194 | 47.10 | 54.01 | 22.02 | 83.34 | 6052 | 22 |
| 39.184017 | 46.85 | 65.52 | 42.41 | 103.47 | 6059 | 18 |
| 39.253021 | 38.19 | 39.06 | 17.39 | 63.55 | 5729 | 6 |
| 39.325661 | 33.29 | 38.43 | 22.76 | 63.91 | 6047 | 6 |

| | | | | | | |
|-----------|-------|--------|--------|--------|------|-----|
| 39.396515 | 31.52 | 48.20 | 28.88 | 73.91 | 6050 | 12 |
| 39.467350 | 35.85 | 57.66 | 49.40 | 94.76 | 6052 | 12 |
| 39.538181 | 35.90 | 63.00 | 39.07 | 93.13 | 6053 | 15 |
| 39.609005 | 35.78 | 61.79 | 37.05 | 91.95 | 6051 | 15 |
| 39.679859 | 34.04 | 50.98 | 33.44 | 80.45 | 6051 | 15 |
| 39.750717 | 33.46 | 55.84 | 60.48 | 100.16 | 6040 | 22 |
| 39.821564 | 31.86 | 55.38 | 72.02 | 111.44 | 6053 | 22 |
| 39.892372 | 39.24 | 54.88 | 65.56 | 107.60 | 6052 | 12 |
| 39.963196 | 43.42 | 48.31 | 19.75 | 78.50 | 6053 | 12 |
| 39.999294 | 19.10 | 93.87 | 3.52 | 96.08 | 117 | 12 |
| 40.034039 | 45.72 | 43.71 | 25.14 | 78.18 | 5811 | 6 |
| 40.103462 | 48.63 | 53.64 | 23.98 | 86.79 | 6058 | 6 |
| 40.174294 | 47.17 | 64.63 | 44.11 | 104.50 | 6055 | 15 |
| 40.245152 | 40.54 | 79.87 | 36.21 | 105.79 | 6055 | 15 |
| 40.315960 | 32.11 | 65.22 | 26.22 | 87.76 | 6060 | 12 |
| 40.386818 | 34.47 | 46.06 | 18.33 | 67.47 | 6061 | 5 |
| 40.457638 | 34.00 | 41.10 | 23.33 | 67.57 | 6053 | 5 |
| 40.528461 | 34.04 | 52.61 | 30.92 | 79.53 | 6053 | 15 |
| 40.599270 | 36.87 | 63.91 | 53.99 | 104.23 | 6048 | 15 |
| 40.670151 | 34.01 | 70.87 | 46.48 | 105.01 | 6053 | 22 |
| 40.740959 | 29.21 | 50.10 | 39.83 | 84.12 | 6039 | 22 |
| 40.811829 | 31.12 | 47.96 | 26.82 | 71.85 | 6049 | 7 |
| 40.882641 | 36.37 | 44.65 | 30.19 | 75.11 | 6054 | 6 |
| 40.953484 | 41.87 | 55.47 | 38.76 | 92.74 | 6053 | 6 |
| 40.994446 | 31.81 | 44.89 | 27.33 | 71.21 | 950 | 6 |
| 41.029179 | 48.26 | 45.79 | 26.22 | 84.02 | 4973 | 12 |
| 41.093739 | 48.53 | 52.81 | 29.36 | 87.80 | 6056 | 12 |
| 41.164581 | 46.50 | 52.71 | 37.54 | 88.27 | 6061 | 9 |
| 41.235382 | 40.55 | 83.67 | 33.08 | 108.17 | 6049 | 9 |
| 41.306252 | 32.77 | 63.62 | 25.85 | 85.53 | 6054 | 15 |
| 41.377071 | 33.17 | 51.02 | 24.46 | 73.48 | 6048 | 6 |
| 41.447929 | 32.17 | 46.62 | 23.39 | 68.96 | 6057 | 6 |
| 41.518726 | 33.59 | 49.75 | 26.66 | 75.98 | 6049 | 7 |
| 41.589573 | 34.26 | 52.64 | 25.75 | 77.69 | 6059 | 7 |
| 41.660404 | 32.89 | 47.65 | 31.28 | 77.26 | 6047 | 9 |
| 41.731251 | 28.36 | 45.40 | 32.04 | 73.28 | 6046 | 9 |
| 41.802094 | 30.93 | 42.98 | 30.05 | 69.48 | 6052 | 7 |
| 41.872940 | 35.09 | 46.99 | 31.34 | 75.78 | 6060 | 7 |
| 41.943771 | 42.29 | 58.70 | 36.50 | 91.44 | 6058 | 18 |
| 41.989571 | 57.04 | 60.37 | 43.51 | 109.69 | 1782 | 18 |
| 42.024342 | 38.02 | 48.11 | 24.21 | 75.22 | 4144 | 15 |
| 42.084003 | 45.85 | 57.72 | 21.94 | 85.19 | 6051 | 15 |
| 42.154861 | 40.01 | 64.14 | 32.02 | 92.59 | 6062 | 32 |
| 42.225681 | 36.97 | 70.26 | 28.68 | 95.73 | 6046 | 32 |
| 42.296528 | 34.93 | 54.13 | 22.03 | 75.13 | 6060 | 12 |
| 42.367313 | 30.96 | 51.53 | 24.10 | 73.34 | 6049 | 12 |
| 42.438194 | 33.85 | 76.14 | 53.31 | 110.54 | 6056 | 12 |
| 42.509029 | 31.20 | 65.73 | 49.92 | 100.77 | 6046 | 9 |
| 42.579803 | 31.54 | 61.33 | 39.59 | 89.72 | 6046 | 9 |
| 42.650696 | 32.38 | 58.97 | 54.87 | 100.34 | 6051 | 15 |
| 42.725498 | 35.82 | 67.98 | 72.15 | 120.37 | 5339 | 15 |
| 42.792385 | 31.63 | 51.12 | 36.15 | 85.33 | 6049 | 12 |
| 42.863228 | 36.17 | 54.25 | 48.31 | 96.40 | 6055 | 12 |
| 42.934040 | 43.16 | 59.18 | 39.11 | 100.06 | 6056 | 32 |
| 42.984711 | 57.02 | 50.34 | 39.13 | 107.72 | 2610 | 32 |
| 43.019501 | 43.47 | 117.72 | 131.51 | 205.59 | 3307 | 80 |
| 43.074272 | 55.45 | 93.43 | 97.47 | 165.91 | 6021 | 80 |
| 43.145161 | 54.39 | 100.25 | 109.17 | 181.11 | 6046 | 80 |
| 43.215939 | 45.02 | 59.64 | 56.32 | 105.60 | 6049 | 80 |
| 43.293461 | 42.32 | 64.52 | 68.13 | 115.50 | 4856 | 80 |
| 43.357582 | 40.70 | 118.40 | 96.44 | 176.17 | 6021 | 80 |
| 43.428493 | 57.79 | 135.55 | 151.44 | 238.82 | 6028 | 111 |
| 43.499374 | 57.13 | 122.89 | 92.02 | 188.48 | 6021 | 111 |
| 43.570091 | 46.78 | 123.21 | 84.19 | 175.74 | 6019 | 67 |
| 43.640995 | 47.32 | 100.29 | 107.19 | 178.66 | 6030 | 32 |
| 43.787128 | 50.30 | 86.41 | 64.44 | 137.34 | 5284 | 18 |
| 43.853497 | 46.38 | 75.13 | 57.65 | 123.78 | 6049 | 18 |
| 43.924328 | 52.60 | 69.35 | 65.26 | 127.15 | 6060 | 15 |
| 43.979862 | 59.78 | 61.14 | 62.96 | 123.14 | 3434 | 15 |
| 44.014595 | 44.01 | 68.26 | 59.95 | 113.81 | 2491 | 18 |
| 44.064571 | 53.42 | 66.61 | 62.98 | 119.69 | 6057 | 18 |

| | | | | | | |
|-----------|-------|-------|--------|--------|------|----|
| 44.135395 | 50.65 | 58.05 | 49.70 | 105.50 | 6050 | 7 |
| 44.206238 | 51.82 | 54.83 | 48.71 | 101.31 | 6059 | 7 |
| 44.347893 | 39.06 | 71.77 | 67.02 | 121.62 | 6051 | 12 |
| 44.418762 | 35.49 | 63.14 | 65.06 | 110.14 | 6050 | 22 |
| 44.489548 | 37.60 | 76.21 | 71.54 | 126.38 | 6048 | 22 |
| 44.560383 | 38.57 | 67.49 | 69.31 | 117.16 | 6047 | 18 |
| 44.631203 | 40.35 | 68.80 | 64.70 | 120.31 | 6049 | 18 |
| 44.702095 | 41.02 | 65.29 | 72.05 | 122.72 | 6055 | 18 |
| 44.772903 | 36.83 | 63.61 | 64.87 | 111.09 | 6045 | 9 |
| 44.843773 | 40.43 | 52.96 | 62.06 | 105.55 | 6055 | 9 |
| 44.914597 | 44.35 | 52.91 | 71.19 | 114.56 | 6056 | 12 |
| 44.974976 | 53.20 | 60.70 | 67.24 | 118.84 | 4264 | 12 |
| 45.009735 | 30.84 | 74.90 | 42.11 | 99.09 | 1659 | 22 |
| 45.054852 | 51.70 | 70.84 | 49.01 | 114.57 | 6054 | 22 |
| 45.125671 | 53.71 | 71.23 | 50.73 | 117.03 | 6051 | 32 |
| 45.196529 | 47.43 | 61.14 | 29.56 | 93.48 | 6062 | 32 |
| 45.267349 | 42.52 | 71.68 | 26.22 | 95.99 | 6051 | 27 |
| 45.338184 | 35.07 | 94.80 | 53.20 | 131.77 | 6057 | 27 |
| 45.408993 | 37.38 | 60.61 | 57.67 | 106.03 | 6044 | 32 |
| 45.479851 | 36.15 | 77.12 | 64.81 | 120.20 | 6045 | 32 |
| 45.550648 | 46.53 | 85.61 | 81.81 | 143.25 | 6033 | 56 |
| 45.621517 | 38.11 | 66.59 | 68.26 | 123.38 | 6048 | 56 |
| 45.692326 | 40.50 | 66.10 | 44.49 | 106.74 | 6034 | 39 |
| 45.763206 | 38.85 | 76.10 | 77.14 | 134.69 | 6053 | 27 |
| 45.834015 | 41.96 | 74.36 | 61.83 | 125.08 | 6033 | 27 |
| 45.904873 | 46.75 | 70.05 | 55.60 | 117.45 | 6051 | 27 |
| 45.970139 | 52.86 | 50.18 | 48.38 | 104.93 | 5100 | 27 |
| 46.004848 | 34.74 | 84.53 | 38.20 | 100.37 | 829 | 27 |
| 46.045128 | 50.17 | 68.56 | 48.90 | 110.06 | 6054 | 27 |
| 46.115936 | 55.03 | 74.86 | 52.43 | 121.61 | 6054 | 27 |
| 46.186806 | 49.39 | 60.97 | 40.20 | 99.24 | 6054 | 27 |
| 46.257591 | 42.74 | 58.44 | 27.14 | 87.35 | 6051 | 9 |
| 46.328438 | 36.95 | 46.56 | 21.73 | 71.56 | 6057 | 9 |
| 46.399296 | 38.14 | 45.67 | 25.87 | 74.26 | 6057 | 6 |
| 46.469826 | 32.61 | 49.60 | 25.15 | 72.38 | 5791 | 6 |
| 46.542141 | 36.06 | 47.39 | 27.29 | 75.15 | 5409 | 9 |
| 46.611816 | 39.26 | 50.24 | 21.80 | 77.34 | 6055 | 9 |
| 46.682640 | 37.40 | 47.39 | 22.32 | 74.44 | 6049 | 7 |
| 46.753506 | 33.80 | 48.89 | 29.98 | 78.65 | 6049 | 22 |
| 46.824329 | 39.22 | 48.65 | 110.62 | 139.97 | 6049 | 22 |
| 46.895184 | 33.95 | 46.73 | 115.68 | 142.19 | 6045 | 32 |
| 46.965302 | 40.20 | 77.20 | 156.04 | 199.69 | 5930 | 32 |
| 47.035439 | 38.23 | 71.82 | 148.53 | 185.08 | 6046 | 12 |
| 47.106239 | 44.23 | 76.19 | 149.39 | 190.04 | 6050 | 12 |
| 47.177082 | 51.95 | 90.16 | 163.12 | 213.25 | 6061 | 9 |
| 47.247906 | 48.90 | 90.23 | 157.78 | 207.60 | 6057 | 9 |
| 47.318748 | 40.82 | 70.59 | 172.24 | 205.16 | 6057 | 4 |
| 47.389595 | 36.33 | 60.51 | 186.25 | 211.07 | 6058 | 3 |
| 47.460426 | 34.52 | 60.70 | 207.43 | 230.73 | 6054 | 3 |
| 47.531261 | 38.52 | 49.73 | 234.40 | 253.49 | 6049 | 7 |
| 47.602081 | 42.15 | 53.60 | 251.98 | 271.90 | 6057 | 7 |
| 47.672928 | 30.70 | 57.98 | 193.17 | 215.96 | 6047 | 9 |
| 47.743786 | 35.26 | 53.73 | 79.70 | 113.32 | 6052 | 9 |
| 47.814617 | 33.62 | 54.09 | 50.39 | 90.77 | 6047 | 7 |
| 47.885452 | 35.06 | 50.72 | 45.29 | 87.56 | 6057 | 5 |
| 47.956249 | 38.21 | 53.35 | 42.21 | 88.83 | 6046 | 5 |
| 47.995823 | 26.17 | 48.49 | 48.44 | 79.56 | 710 | 5 |
| 48.030567 | 41.56 | 55.54 | 44.40 | 91.53 | 5216 | 3 |
| 48.096550 | 39.28 | 58.10 | 56.07 | 99.77 | 6049 | 3 |
| 48.167374 | 37.90 | 52.41 | 46.74 | 87.80 | 6060 | 3 |
| 48.238194 | 33.78 | 44.52 | 50.10 | 83.30 | 6059 | 3 |
| 48.309052 | 30.39 | 43.80 | 52.56 | 84.39 | 6059 | 4 |
| 48.379860 | 28.81 | 48.21 | 65.58 | 96.15 | 6055 | 12 |
| 48.450706 | 29.60 | 51.21 | 78.51 | 106.68 | 6056 | 12 |
| 48.521515 | 34.51 | 51.09 | 62.40 | 98.00 | 6045 | 9 |
| 48.592261 | 38.27 | 58.93 | 72.09 | 113.31 | 6055 | 9 |
| 48.663181 | 35.64 | 58.04 | 71.23 | 112.42 | 6040 | 6 |
| 48.734062 | 33.47 | 61.08 | 69.35 | 110.95 | 6046 | 6 |
| 48.879421 | 34.55 | 53.14 | 64.49 | 104.83 | 5428 | 3 |
| 48.946552 | 37.78 | 56.12 | 54.94 | 98.11 | 6052 | 3 |
| 48.990971 | 57.77 | 42.94 | 68.68 | 114.61 | 1544 | 3 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 49.025742 | 31.37 | 57.23 | 18.91 | 75.11 | 4389 | 0 |
| 49.086807 | 39.75 | 59.86 | 23.42 | 86.50 | 6047 | 0 |
| 49.157650 | 36.73 | 58.60 | 24.59 | 84.26 | 6060 | 2 |
| 49.228474 | 33.65 | 52.51 | 20.46 | 73.01 | 6055 | 2 |
| 49.299316 | 31.01 | 42.36 | 17.80 | 63.61 | 6065 | 2 |
| 49.370152 | 28.18 | 37.60 | 21.71 | 59.16 | 6058 | 2 |
| 49.440994 | 27.36 | 44.68 | 23.86 | 65.25 | 6059 | 2 |
| 49.511795 | 31.17 | 50.02 | 22.67 | 71.02 | 6042 | 2 |
| 49.582649 | 36.55 | 57.27 | 19.75 | 79.30 | 6049 | 2 |
| 49.653484 | 34.98 | 50.69 | 16.97 | 72.53 | 6053 | 0 |
| 49.724339 | 34.27 | 50.55 | 19.85 | 72.65 | 6053 | 0 |
| 49.795151 | 34.11 | 51.67 | 22.90 | 75.03 | 6051 | 2 |
| 49.866032 | 32.74 | 48.79 | 23.52 | 72.68 | 6051 | 2 |
| 49.936817 | 36.45 | 51.32 | 20.49 | 75.67 | 6056 | 0 |
| 49.986111 | 51.02 | 52.81 | 26.07 | 90.89 | 2370 | 0 |
| 50.020882 | 26.69 | 46.77 | 18.79 | 62.16 | 3559 | 0 |
| 50.077084 | 38.74 | 56.82 | 20.06 | 79.59 | 6056 | 0 |
| 50.147919 | 33.63 | 61.03 | 22.67 | 82.79 | 6058 | 0 |
| 50.218727 | 33.26 | 47.45 | 19.22 | 68.55 | 6055 | 0 |
| 50.289597 | 29.57 | 41.62 | 18.93 | 62.94 | 6053 | 5 |
| 50.360428 | 27.97 | 48.73 | 27.67 | 71.98 | 6049 | 5 |
| 50.431263 | 28.63 | 44.63 | 34.46 | 72.98 | 6053 | 7 |
| 50.502083 | 31.22 | 42.71 | 20.87 | 63.61 | 6047 | 3 |
| 50.572895 | 34.13 | 50.80 | 27.04 | 76.87 | 6045 | 3 |
| 50.643738 | 34.46 | 51.57 | 25.74 | 76.56 | 6052 | 3 |
| 50.714607 | 33.51 | 50.57 | 20.96 | 72.05 | 6050 | 3 |
| 50.785439 | 30.90 | 47.28 | 24.38 | 71.16 | 6053 | 3 |
| 50.856285 | 30.25 | 44.55 | 29.64 | 73.31 | 6047 | 3 |
| 50.927105 | 34.56 | 49.96 | 29.83 | 81.84 | 6052 | 3 |
| 50.981251 | 41.40 | 46.92 | 22.93 | 77.54 | 3199 | 3 |
| 51.016018 | 30.07 | 52.24 | 19.60 | 68.00 | 2726 | 2 |
| 51.067371 | 37.13 | 55.08 | 21.39 | 77.57 | 6049 | 2 |
| 51.138195 | 33.63 | 51.83 | 27.27 | 75.42 | 6059 | 3 |
| 51.209026 | 33.23 | 56.22 | 25.12 | 78.40 | 6050 | 3 |
| 51.279861 | 30.57 | 60.36 | 24.05 | 80.37 | 6060 | 6 |
| 51.350693 | 27.58 | 43.20 | 28.08 | 66.33 | 6050 | 6 |
| 51.421562 | 27.83 | 44.86 | 27.79 | 66.78 | 6053 | 4 |
| 51.492374 | 29.41 | 45.71 | 23.87 | 66.18 | 6053 | 4 |
| 51.563171 | 33.57 | 51.99 | 21.29 | 73.41 | 6046 | 2 |
| 51.634014 | 34.85 | 52.49 | 17.59 | 73.81 | 6050 | 0 |
| 51.704872 | 32.87 | 48.60 | 20.20 | 71.12 | 6047 | 0 |
| 51.775696 | 30.28 | 47.33 | 26.01 | 71.64 | 6041 | 4 |
| 51.846561 | 29.90 | 46.61 | 27.72 | 73.79 | 6049 | 4 |
| 51.917362 | 34.48 | 57.37 | 36.38 | 90.11 | 6046 | 22 |
| 51.976391 | 39.45 | 69.53 | 40.63 | 104.93 | 4029 | 22 |
| 52.011112 | 31.87 | 43.12 | 48.04 | 86.56 | 1901 | 22 |
| 52.057594 | 35.37 | 65.64 | 33.77 | 94.25 | 6037 | 22 |
| 52.128460 | 35.67 | 74.95 | 66.78 | 126.55 | 6034 | 39 |
| 52.199284 | 29.40 | 63.47 | 32.72 | 86.76 | 6053 | 39 |
| 52.270172 | 28.28 | 66.62 | 30.28 | 87.51 | 6053 | 15 |
| 52.340984 | 25.17 | 67.89 | 39.13 | 93.19 | 6060 | 15 |
| 52.411831 | 24.72 | 42.82 | 31.52 | 67.61 | 6050 | 12 |
| 52.482639 | 29.08 | 55.54 | 29.57 | 77.13 | 6050 | 12 |
| 52.553459 | 30.82 | 64.31 | 29.83 | 85.47 | 6051 | 22 |
| 52.624294 | 34.61 | 69.65 | 50.72 | 103.05 | 6053 | 22 |
| 52.695187 | 33.73 | 61.85 | 55.87 | 102.31 | 6037 | 39 |
| 52.765984 | 31.41 | 58.14 | 45.43 | 93.84 | 6049 | 12 |
| 52.836842 | 33.81 | 52.02 | 21.69 | 75.88 | 6048 | 12 |
| 52.907661 | 35.86 | 46.02 | 30.62 | 79.38 | 6052 | 7 |
| 52.971539 | 37.93 | 56.98 | 34.49 | 90.25 | 4857 | 7 |
| 53.006248 | 33.93 | 38.17 | 10.95 | 54.70 | 1069 | 7 |
| 53.047882 | 37.45 | 57.91 | 29.06 | 83.62 | 6035 | 7 |
| 53.118752 | 37.62 | 60.15 | 27.95 | 85.89 | 6056 | 7 |
| 53.189583 | 36.56 | 51.04 | 23.49 | 73.98 | 6059 | 9 |
| 53.258785 | 31.87 | 45.05 | 22.74 | 68.47 | 5775 | 3 |
| 53.331261 | 28.24 | 40.25 | 24.14 | 63.45 | 6057 | 3 |
| 53.402084 | 27.45 | 40.44 | 22.58 | 62.20 | 6052 | 3 |
| 53.472904 | 29.13 | 40.82 | 22.71 | 63.82 | 6049 | 3 |
| 53.543728 | 33.07 | 49.31 | 26.00 | 74.14 | 6049 | 7 |
| 53.614571 | 33.70 | 47.11 | 23.80 | 70.67 | 6049 | 7 |
| 53.685440 | 30.03 | 52.81 | 27.32 | 73.45 | 6056 | 6 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 53.756271 | 32.45 | 48.74 | 24.62 | 70.67 | 6046 | 4 |
| 53.827106 | 28.80 | 51.01 | 27.55 | 72.53 | 6044 | 4 |
| 53.897942 | 29.71 | 47.82 | 32.04 | 73.00 | 6056 | 6 |
| 53.966679 | 31.65 | 51.12 | 30.22 | 76.95 | 5694 | 6 |
| 54.001400 | 23.93 | 64.26 | 10.77 | 69.78 | 235 | 7 |
| 54.038193 | 29.41 | 56.83 | 32.56 | 80.85 | 6041 | 7 |
| 54.109028 | 31.18 | 58.68 | 28.06 | 79.47 | 6057 | 7 |
| 54.179874 | 31.34 | 55.87 | 26.30 | 76.62 | 6057 | 3 |
| 54.250683 | 28.77 | 53.55 | 18.34 | 70.35 | 6057 | 6 |
| 54.321514 | 25.11 | 63.28 | 25.65 | 81.51 | 6053 | 6 |
| 54.392384 | 23.96 | 50.72 | 25.06 | 69.33 | 6055 | 15 |
| 54.463196 | 26.51 | 62.06 | 37.29 | 86.08 | 6054 | 15 |
| 54.533901 | 30.38 | 72.34 | 67.10 | 117.31 | 6009 | 27 |
| 54.604851 | 34.38 | 62.82 | 51.70 | 99.28 | 6050 | 27 |
| 54.675716 | 31.76 | 57.91 | 35.49 | 85.43 | 6043 | 18 |
| 54.746552 | 32.96 | 54.39 | 42.00 | 88.69 | 6038 | 18 |
| 54.817383 | 32.15 | 57.35 | 35.64 | 84.39 | 6047 | 4 |
| 54.888195 | 30.65 | 55.92 | 39.43 | 84.48 | 6051 | 6 |
| 54.959026 | 30.21 | 56.25 | 32.06 | 80.42 | 6048 | 6 |
| 54.997211 | 41.07 | 40.40 | 15.83 | 68.06 | 473 | 6 |
| 55.031933 | 29.57 | 62.91 | 40.86 | 89.82 | 5452 | 15 |
| 55.099281 | 28.65 | 62.42 | 36.77 | 86.44 | 6051 | 15 |
| 55.170139 | 33.45 | 71.39 | 41.74 | 99.75 | 6050 | 39 |
| 55.240948 | 28.74 | 85.07 | 33.75 | 106.82 | 6056 | 39 |
| 55.311806 | 27.12 | 51.75 | 26.16 | 73.15 | 6050 | 22 |
| 55.382664 | 28.50 | 66.77 | 49.26 | 99.17 | 6056 | 39 |
| 55.453506 | 29.67 | 63.59 | 43.98 | 95.64 | 6038 | 39 |
| 55.524376 | 30.14 | 62.93 | 61.16 | 105.72 | 6016 | 27 |
| 55.595127 | 36.96 | 73.27 | 62.73 | 120.43 | 6043 | 27 |
| 55.665974 | 37.76 | 57.08 | 51.17 | 99.38 | 6052 | 27 |
| 55.736828 | 37.35 | 68.94 | 52.08 | 108.62 | 6043 | 27 |
| 55.807663 | 30.84 | 50.23 | 37.66 | 81.17 | 6051 | 32 |
| 55.878483 | 35.23 | 54.89 | 60.04 | 101.04 | 6051 | 39 |
| 55.949329 | 40.57 | 49.58 | 45.74 | 91.96 | 6058 | 39 |
| 55.992359 | 48.13 | 52.99 | 51.26 | 105.11 | 1307 | 39 |
| 56.027119 | 42.62 | 62.85 | 53.07 | 102.83 | 4624 | 22 |
| 56.089584 | 44.59 | 58.27 | 49.18 | 100.25 | 6055 | 22 |
| 56.160427 | 45.57 | 67.77 | 55.50 | 110.84 | 6058 | 32 |
| 56.231239 | 34.70 | 70.45 | 39.96 | 97.28 | 6059 | 32 |
| 56.302082 | 33.33 | 62.56 | 41.07 | 96.41 | 6056 | 27 |
| 56.372917 | 29.00 | 48.66 | 30.25 | 71.91 | 6060 | 27 |
| 56.443748 | 29.39 | 49.16 | 31.92 | 75.48 | 6055 | 18 |
| 56.514572 | 32.42 | 57.26 | 44.57 | 89.87 | 6052 | 22 |
| 56.585403 | 33.14 | 47.55 | 31.58 | 75.48 | 6055 | 22 |
| 56.656227 | 31.68 | 50.43 | 36.24 | 79.89 | 6044 | 18 |
| 56.727081 | 29.29 | 46.86 | 38.25 | 76.63 | 6047 | 18 |
| 56.797951 | 29.33 | 43.85 | 37.10 | 75.93 | 6051 | 9 |
| 56.868774 | 30.08 | 42.37 | 44.81 | 78.35 | 6052 | 9 |
| 56.939606 | 35.16 | 50.21 | 42.09 | 84.56 | 6058 | 15 |
| 56.987488 | 48.50 | 56.02 | 45.03 | 98.62 | 2139 | 15 |
| 57.022282 | 33.93 | 47.44 | 49.07 | 85.98 | 3789 | 15 |
| 57.079861 | 44.01 | 61.08 | 46.74 | 101.42 | 6055 | 15 |
| 57.150684 | 38.59 | 58.03 | 49.01 | 94.89 | 6056 | 12 |
| 57.363205 | 29.54 | 51.75 | 63.73 | 96.69 | 6056 | 15 |
| 57.434052 | 26.93 | 59.19 | 62.18 | 100.16 | 6054 | 18 |
| 57.510185 | 30.88 | 52.40 | 50.34 | 89.13 | 5121 | 7 |
| 57.575672 | 32.33 | 50.04 | 53.71 | 92.14 | 6047 | 7 |
| 57.646503 | 31.76 | 49.63 | 54.27 | 91.95 | 6055 | 15 |
| 57.717373 | 29.88 | 47.77 | 63.51 | 98.84 | 6046 | 15 |
| 57.788219 | 30.44 | 47.77 | 68.08 | 101.78 | 6055 | 27 |
| 57.859062 | 33.39 | 60.53 | 66.09 | 110.58 | 6048 | 27 |
| 57.929897 | 35.54 | 53.96 | 51.59 | 95.09 | 6054 | 18 |
| 57.982605 | 41.11 | 57.88 | 58.34 | 104.28 | 2955 | 18 |
| 58.017384 | 41.14 | 60.51 | 39.41 | 93.54 | 2967 | 22 |
| 58.070148 | 42.12 | 58.71 | 35.29 | 88.97 | 6055 | 22 |
| 58.140900 | 30.50 | 54.78 | 36.87 | 88.35 | 6003 | 7 |
| 58.211945 | 36.82 | 59.33 | 28.52 | 82.75 | 6025 | 7 |
| 58.282650 | 33.46 | 64.30 | 21.60 | 83.21 | 6055 | 9 |
| 58.353485 | 28.93 | 47.96 | 22.12 | 67.79 | 6058 | 9 |
| 58.424305 | 27.87 | 48.17 | 24.12 | 68.14 | 6047 | 15 |
| 58.495140 | 29.27 | 45.94 | 28.16 | 69.32 | 6054 | 15 |

| | | | | | | |
|-----------|-------|--------|-------|--------|------|----|
| 58.565880 | 33.66 | 58.36 | 41.29 | 88.52 | 6029 | 18 |
| 58.636784 | 31.31 | 51.36 | 38.51 | 81.59 | 6053 | 15 |
| 58.707626 | 30.35 | 48.27 | 42.90 | 80.71 | 6041 | 15 |
| 58.778484 | 27.23 | 45.47 | 39.48 | 75.81 | 6052 | 9 |
| 58.849304 | 27.81 | 46.39 | 41.81 | 80.05 | 6042 | 9 |
| 58.920162 | 35.35 | 50.94 | 34.97 | 80.46 | 6057 | 9 |
| 58.977757 | 35.75 | 55.81 | 38.58 | 86.05 | 3788 | 9 |
| 59.012501 | 34.57 | 42.53 | 23.91 | 68.50 | 2137 | 15 |
| 59.060406 | 38.02 | 53.62 | 30.62 | 80.33 | 6047 | 15 |
| 59.131237 | 40.90 | 71.87 | 66.80 | 119.69 | 6056 | 27 |
| 59.202061 | 38.67 | 86.58 | 45.45 | 115.83 | 6054 | 27 |
| 59.272919 | 31.76 | 62.99 | 34.31 | 85.92 | 6057 | 15 |
| 59.343761 | 28.47 | 46.72 | 25.12 | 67.94 | 6060 | 15 |
| 59.414581 | 27.20 | 49.81 | 30.41 | 72.57 | 6055 | 15 |
| 59.485394 | 33.05 | 59.01 | 54.16 | 97.56 | 6048 | 15 |
| 59.556236 | 38.30 | 61.36 | 53.27 | 103.81 | 6049 | 27 |
| 59.627083 | 37.91 | 47.28 | 32.39 | 79.72 | 6053 | 12 |
| 59.697941 | 39.02 | 53.06 | 34.50 | 85.56 | 6055 | 12 |
| 59.768772 | 34.81 | 50.02 | 32.21 | 78.19 | 6054 | 7 |
| 59.839607 | 32.26 | 47.77 | 32.59 | 75.60 | 6051 | 7 |
| 59.910450 | 35.73 | 47.27 | 39.21 | 82.06 | 6061 | 9 |
| 59.972927 | 38.31 | 50.39 | 35.45 | 82.63 | 4621 | 9 |
| 60.007648 | 26.93 | 42.59 | 38.28 | 71.67 | 1307 | 3 |
| 60.050694 | 35.49 | 55.10 | 41.65 | 87.31 | 6053 | 3 |
| 60.121529 | 34.90 | 56.58 | 44.04 | 89.38 | 6055 | 3 |
| 60.192371 | 36.61 | 53.57 | 42.40 | 86.85 | 6060 | 5 |
| 60.256111 | 33.91 | 54.06 | 43.21 | 86.36 | 4813 | 9 |
| 60.334015 | 27.70 | 51.89 | 49.65 | 87.31 | 6058 | 9 |
| 60.404884 | 25.18 | 51.00 | 57.11 | 89.67 | 6046 | 15 |
| 60.475693 | 29.59 | 53.46 | 50.04 | 90.25 | 6054 | 15 |
| 60.546505 | 32.75 | 51.75 | 48.60 | 88.91 | 6039 | 9 |
| 60.617352 | 34.66 | 51.75 | 53.60 | 93.35 | 6057 | 9 |
| 60.688206 | 33.60 | 49.77 | 52.52 | 92.39 | 6050 | 5 |
| 60.833969 | 31.00 | 48.72 | 44.59 | 83.38 | 5353 | 4 |
| 60.900719 | 31.87 | 48.40 | 52.68 | 89.32 | 6060 | 5 |
| 60.968056 | 34.97 | 46.68 | 51.38 | 87.61 | 5445 | 5 |
| 61.002789 | 38.88 | 70.79 | 12.59 | 82.72 | 473 | 9 |
| 61.040962 | 35.53 | 56.59 | 35.52 | 84.04 | 6052 | 9 |
| 61.111805 | 36.66 | 55.07 | 32.07 | 81.83 | 6052 | 9 |
| 61.182640 | 34.30 | 78.59 | 38.62 | 103.45 | 6048 | 22 |
| 61.253460 | 31.17 | 90.41 | 53.86 | 123.60 | 6049 | 32 |
| 61.324306 | 29.82 | 108.22 | 58.53 | 138.98 | 6048 | 32 |
| 61.395172 | 28.21 | 56.84 | 45.75 | 89.34 | 6047 | 22 |
| 61.465973 | 30.73 | 62.33 | 61.61 | 107.47 | 6043 | 22 |
| 61.536781 | 31.33 | 53.66 | 52.48 | 94.13 | 6039 | 18 |
| 61.607628 | 37.83 | 58.11 | 70.42 | 113.72 | 6048 | 18 |
| 61.678459 | 38.16 | 60.30 | 61.28 | 110.28 | 6044 | 18 |
| 61.749329 | 35.14 | 54.03 | 39.28 | 87.20 | 6046 | 18 |
| 61.820175 | 32.57 | 59.61 | 41.96 | 91.95 | 6040 | 15 |
| 61.891006 | 33.99 | 52.03 | 43.45 | 87.13 | 6049 | 32 |
| 61.961842 | 38.72 | 66.12 | 40.57 | 97.72 | 6047 | 32 |
| 61.998611 | 22.50 | 113.28 | 9.21 | 117.15 | 237 | 32 |
| 62.033344 | 43.04 | 68.09 | 64.88 | 116.12 | 5687 | 39 |
| 62.102058 | 45.96 | 70.87 | 51.31 | 111.05 | 6041 | 39 |
| 62.172916 | 38.13 | 86.19 | 47.08 | 115.83 | 6057 | 18 |
| 62.243736 | 33.81 | 58.17 | 23.80 | 78.14 | 6054 | 18 |
| 62.314583 | 30.29 | 45.13 | 19.85 | 65.57 | 6050 | 6 |
| 62.385441 | 29.23 | 41.75 | 25.47 | 65.00 | 6050 | 4 |
| 62.456261 | 28.46 | 42.29 | 23.15 | 63.16 | 6058 | 4 |
| 62.527096 | 32.46 | 47.15 | 27.08 | 71.69 | 6042 | 7 |
| 62.597893 | 34.79 | 47.44 | 23.71 | 72.37 | 6050 | 7 |
| 62.668762 | 32.46 | 51.51 | 25.79 | 75.08 | 6052 | 4 |
| 62.739582 | 31.82 | 46.56 | 29.36 | 71.08 | 6041 | 4 |
| 62.810452 | 31.47 | 46.38 | 29.17 | 70.81 | 6040 | 3 |
| 62.881248 | 30.81 | 47.44 | 41.54 | 79.16 | 6048 | 7 |
| 62.952106 | 34.80 | 52.62 | 35.04 | 82.26 | 6048 | 7 |
| 62.993752 | 34.66 | 55.35 | 29.42 | 78.44 | 1069 | 7 |
| 63.028496 | 36.07 | 50.69 | 29.71 | 77.88 | 4857 | 4 |
| 63.092373 | 36.83 | 56.13 | 28.71 | 80.69 | 6052 | 4 |
| 63.163219 | 36.51 | 60.10 | 23.82 | 80.93 | 6061 | 2 |
| 63.233875 | 34.26 | 48.03 | 17.07 | 66.53 | 6031 | 2 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 63.304005 | 30.21 | 43.98 | 15.80 | 61.44 | 5898 | 2 |
| 63.375706 | 27.49 | 40.36 | 18.75 | 59.06 | 6050 | 4 |
| 63.446529 | 26.76 | 42.23 | 21.20 | 61.40 | 6060 | 4 |
| 63.517338 | 31.25 | 45.82 | 32.73 | 73.34 | 6048 | 7 |
| 63.588161 | 33.68 | 50.55 | 36.75 | 80.79 | 6052 | 7 |
| 63.658981 | 31.14 | 57.79 | 28.28 | 79.74 | 6042 | 5 |
| 63.729885 | 31.12 | 50.02 | 34.41 | 76.05 | 6046 | 5 |
| 63.800682 | 30.19 | 45.38 | 34.96 | 74.07 | 6038 | 9 |
| 63.871540 | 30.75 | 48.02 | 45.86 | 84.10 | 6053 | 9 |
| 63.942360 | 33.40 | 53.88 | 38.60 | 84.17 | 6047 | 6 |
| 63.988876 | 52.21 | 57.24 | 40.79 | 97.49 | 1899 | 6 |
| 64.023659 | 26.12 | 48.59 | 22.01 | 67.62 | 4032 | 0 |
| 64.082619 | 37.63 | 57.88 | 29.65 | 82.93 | 6046 | 0 |
| 64.153473 | 34.78 | 58.05 | 26.12 | 79.00 | 6063 | 0 |
| 64.224281 | 33.94 | 49.16 | 16.74 | 67.06 | 6050 | 0 |
| 64.295151 | 30.08 | 46.14 | 17.19 | 63.25 | 6062 | 2 |
| 64.366493 | 26.89 | 39.50 | 17.52 | 56.78 | 5964 | 2 |
| 64.436813 | 24.91 | 42.77 | 17.36 | 59.20 | 6056 | 3 |
| 64.507652 | 28.99 | 47.66 | 21.80 | 66.87 | 6055 | 6 |
| 64.578461 | 31.89 | 53.95 | 25.26 | 75.25 | 6055 | 6 |
| 64.649307 | 32.01 | 50.09 | 40.93 | 81.67 | 6054 | 7 |
| 64.720154 | 31.46 | 48.19 | 26.60 | 72.71 | 6050 | 7 |
| 64.790993 | 30.29 | 46.69 | 29.51 | 70.69 | 6052 | 3 |
| 64.861832 | 29.51 | 48.23 | 30.87 | 72.23 | 6045 | 3 |
| 64.932663 | 32.71 | 48.47 | 30.29 | 74.41 | 6053 | 3 |
| 64.984032 | 41.36 | 47.93 | 36.11 | 81.55 | 2724 | 3 |
| 65.018822 | 27.67 | 50.05 | 21.75 | 69.06 | 3192 | 2 |
| 65.072906 | 35.47 | 56.09 | 27.25 | 79.10 | 6054 | 2 |
| 65.143753 | 32.31 | 66.80 | 33.40 | 88.40 | 6057 | 7 |
| 65.214584 | 32.73 | 61.20 | 25.60 | 82.80 | 6055 | 7 |
| 65.285431 | 29.90 | 47.40 | 14.11 | 62.88 | 6062 | 3 |
| 65.356247 | 26.69 | 45.68 | 21.80 | 63.36 | 6057 | 3 |
| 65.427116 | 24.53 | 51.99 | 30.17 | 72.27 | 6053 | 4 |
| 65.497902 | 28.17 | 47.75 | 25.19 | 68.98 | 6047 | 4 |
| 65.568726 | 32.01 | 53.19 | 24.89 | 73.56 | 6049 | 5 |
| 65.639580 | 32.14 | 50.60 | 31.77 | 76.98 | 6053 | 6 |
| 65.710419 | 32.23 | 48.82 | 39.06 | 81.46 | 6046 | 6 |
| 65.781273 | 29.59 | 46.90 | 41.43 | 80.20 | 6050 | 7 |
| 65.852119 | 28.14 | 58.19 | 43.55 | 90.67 | 6047 | 7 |
| 65.922943 | 33.19 | 60.54 | 42.85 | 93.82 | 6043 | 15 |
| 65.979141 | 34.55 | 51.35 | 41.21 | 82.81 | 3553 | 15 |
| 66.013901 | 34.38 | 58.27 | 21.68 | 78.51 | 2376 | 6 |
| 66.063187 | 34.78 | 56.46 | 27.43 | 79.11 | 6042 | 6 |
| 66.134018 | 32.69 | 59.55 | 28.11 | 81.87 | 6057 | 9 |
| 66.204849 | 34.47 | 65.09 | 26.85 | 85.31 | 6059 | 9 |
| 66.275696 | 31.59 | 79.48 | 30.23 | 98.26 | 6044 | 15 |
| 66.346474 | 26.92 | 89.42 | 60.02 | 121.66 | 6046 | 15 |
| 66.417374 | 22.34 | 55.57 | 33.65 | 75.83 | 6048 | 15 |
| 66.488197 | 25.61 | 64.55 | 41.44 | 91.11 | 6051 | 15 |
| 66.559013 | 28.33 | 61.41 | 39.62 | 88.07 | 6049 | 12 |
| 66.629829 | 31.83 | 55.89 | 30.35 | 79.12 | 6048 | 15 |
| 66.700706 | 32.34 | 56.25 | 49.10 | 92.06 | 6054 | 15 |
| 66.772163 | 29.08 | 55.76 | 56.76 | 96.10 | 5880 | 9 |
| 66.842400 | 29.16 | 53.70 | 53.23 | 93.38 | 6045 | 9 |
| 66.913216 | 33.54 | 46.70 | 40.16 | 81.06 | 6055 | 15 |
| 66.974281 | 40.34 | 50.43 | 47.12 | 92.31 | 4384 | 15 |
| 67.009026 | 34.96 | 54.83 | 21.96 | 75.35 | 1543 | 15 |
| 67.053436 | 42.36 | 67.11 | 56.18 | 108.11 | 6048 | 15 |
| 67.124283 | 41.62 | 67.14 | 59.41 | 110.82 | 6053 | 15 |
| 67.195160 | 38.86 | 94.81 | 54.99 | 126.42 | 6050 | 22 |
| 67.265945 | 35.74 | 77.58 | 39.46 | 103.26 | 6056 | 18 |
| 67.336807 | 27.19 | 74.83 | 35.03 | 96.78 | 6059 | 18 |
| 67.407654 | 25.33 | 71.04 | 46.18 | 97.99 | 6050 | 15 |
| 67.478493 | 27.59 | 58.32 | 37.33 | 83.31 | 6048 | 15 |
| 67.549278 | 31.55 | 61.42 | 38.51 | 87.91 | 6044 | 15 |
| 67.620125 | 34.13 | 62.82 | 63.16 | 106.15 | 6053 | 15 |
| 67.690994 | 31.14 | 49.07 | 32.83 | 78.90 | 6049 | 15 |
| 67.761818 | 31.36 | 44.59 | 26.43 | 69.61 | 6048 | 12 |
| 67.832664 | 30.98 | 52.70 | 53.67 | 92.65 | 6045 | 12 |
| 67.903496 | 34.79 | 56.24 | 62.02 | 102.48 | 6056 | 18 |
| 67.969437 | 39.24 | 56.02 | 50.66 | 97.59 | 5214 | 18 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 68.004181 | 42.78 | 71.25 | 7.88 | 84.42 | 711 | 9 |
| 68.043762 | 38.99 | 64.86 | 41.19 | 96.09 | 6045 | 9 |
| 68.114571 | 42.32 | 59.14 | 35.46 | 91.42 | 6057 | 9 |
| 68.185417 | 39.76 | 95.63 | 55.84 | 128.84 | 6055 | 12 |
| 68.256241 | 34.57 | 65.00 | 22.32 | 82.62 | 6054 | 6 |
| 68.327057 | 31.08 | 54.53 | 38.58 | 84.12 | 6060 | 6 |
| 68.397903 | 25.99 | 63.95 | 40.15 | 89.06 | 6048 | 15 |
| 68.468727 | 26.14 | 66.41 | 45.66 | 93.92 | 6051 | 15 |
| 68.539551 | 29.47 | 65.74 | 46.63 | 95.13 | 6048 | 15 |
| 68.610405 | 32.70 | 69.46 | 55.62 | 106.50 | 6048 | 15 |
| 68.681252 | 35.03 | 63.15 | 50.24 | 100.56 | 6048 | 27 |
| 68.752121 | 32.89 | 64.07 | 80.53 | 124.36 | 6043 | 22 |
| 68.822929 | 35.26 | 71.36 | 76.20 | 125.40 | 6050 | 22 |
| 68.893776 | 37.26 | 62.22 | 57.08 | 107.20 | 6054 | 7 |
| 68.964584 | 41.97 | 50.83 | 34.87 | 85.66 | 6055 | 7 |
| 69.034737 | 46.50 | 56.34 | 37.44 | 92.41 | 5928 | 9 |
| 69.104851 | 46.48 | 59.51 | 36.20 | 92.86 | 6056 | 9 |
| 69.175705 | 43.62 | 63.02 | 33.15 | 91.12 | 6059 | 3 |
| 69.246506 | 41.65 | 56.12 | 19.47 | 77.60 | 6057 | 3 |
| 69.317352 | 34.06 | 47.66 | 20.32 | 69.09 | 6058 | 2 |
| 69.388184 | 32.33 | 45.21 | 19.39 | 66.30 | 6053 | 3 |
| 69.459007 | 30.30 | 45.96 | 18.92 | 66.26 | 6053 | 3 |
| 69.529861 | 33.84 | 53.13 | 31.40 | 79.64 | 6047 | 6 |
| 69.600685 | 35.36 | 55.85 | 24.10 | 79.21 | 6057 | 6 |
| 69.671509 | 33.99 | 50.33 | 19.87 | 71.78 | 6049 | 3 |
| 69.742363 | 29.28 | 42.18 | 27.40 | 66.97 | 6043 | 3 |
| 69.813217 | 29.83 | 46.27 | 26.89 | 68.95 | 6054 | 4 |
| 69.884026 | 32.85 | 42.67 | 37.93 | 73.60 | 6051 | 4 |
| 69.954849 | 38.65 | 44.31 | 35.66 | 77.54 | 6055 | 4 |
| 69.995125 | 25.08 | 46.96 | 27.61 | 64.67 | 831 | 4 |
| 70.029877 | 43.18 | 45.74 | 33.39 | 80.60 | 5094 | 4 |
| 70.095116 | 41.31 | 52.57 | 41.82 | 88.82 | 6051 | 4 |
| 70.165962 | 39.00 | 56.45 | 39.75 | 87.97 | 6052 | 3 |
| 70.236755 | 37.26 | 47.58 | 40.13 | 80.01 | 6052 | 3 |
| 70.307625 | 30.67 | 49.29 | 39.96 | 79.05 | 6058 | 5 |
| 70.378487 | 29.22 | 61.30 | 58.09 | 99.10 | 6046 | 7 |
| 70.449280 | 30.47 | 59.78 | 60.60 | 101.52 | 6048 | 7 |
| 70.520119 | 33.65 | 62.21 | 61.23 | 104.60 | 6042 | 9 |
| 70.590958 | 33.66 | 62.42 | 74.29 | 116.91 | 6045 | 9 |
| 70.661804 | 31.63 | 58.73 | 67.41 | 110.46 | 6041 | 9 |
| 70.807732 | 35.89 | 58.75 | 68.39 | 111.48 | 5312 | 7 |
| 70.874306 | 35.07 | 64.01 | 72.73 | 119.20 | 6051 | 7 |
| 70.945160 | 44.28 | 55.59 | 64.90 | 112.46 | 6050 | 27 |
| 70.990257 | 63.49 | 85.10 | 88.59 | 158.16 | 1662 | 27 |
| 71.025002 | 40.38 | 62.12 | 56.81 | 102.89 | 4262 | 22 |
| 71.086571 | 52.98 | 70.98 | 60.41 | 119.64 | 5831 | 22 |
| 71.156235 | 48.05 | 74.43 | 50.94 | 113.47 | 6059 | 18 |
| 71.227051 | 42.32 | 59.76 | 28.01 | 85.39 | 6051 | 18 |
| 71.297905 | 35.67 | 74.34 | 46.48 | 108.73 | 6056 | 12 |
| 71.368736 | 31.87 | 65.48 | 47.34 | 98.21 | 6055 | 12 |
| 71.439583 | 30.23 | 56.97 | 39.70 | 84.09 | 6056 | 6 |
| 71.510406 | 32.87 | 58.42 | 42.42 | 90.01 | 6052 | 22 |
| 71.581238 | 34.57 | 59.26 | 59.45 | 103.34 | 6055 | 22 |
| 71.652069 | 33.58 | 56.35 | 40.51 | 88.55 | 6053 | 7 |
| 71.722939 | 33.17 | 57.70 | 57.34 | 101.32 | 6042 | 7 |
| 71.793770 | 32.92 | 54.76 | 51.67 | 94.94 | 6053 | 5 |
| 71.864586 | 32.83 | 56.77 | 48.44 | 94.99 | 6049 | 5 |
| 71.935425 | 38.31 | 53.83 | 43.57 | 91.16 | 6058 | 9 |
| 71.985397 | 47.30 | 60.68 | 44.78 | 101.67 | 2490 | 9 |
| 72.020172 | 35.49 | 60.30 | 48.23 | 95.63 | 3432 | 12 |
| 72.075668 | 47.80 | 73.85 | 51.01 | 113.69 | 6046 | 12 |
| 72.146515 | 40.08 | 64.14 | 38.89 | 92.77 | 6061 | 22 |
| 72.217339 | 43.68 | 83.12 | 52.04 | 116.90 | 6039 | 22 |
| 72.288208 | 36.05 | 82.17 | 43.72 | 109.18 | 6051 | 27 |
| 72.370094 | 19.48 | 56.92 | 28.52 | 72.89 | 4071 | 27 |
| 72.439962 | 26.06 | 55.46 | 28.42 | 75.54 | 6058 | 32 |
| 72.500687 | 31.02 | 62.48 | 53.05 | 99.99 | 6046 | 27 |
| 72.571480 | 29.44 | 66.82 | 30.26 | 87.33 | 6046 | 27 |
| 72.642365 | 33.51 | 56.58 | 33.96 | 83.87 | 6051 | 15 |
| 72.713219 | 31.77 | 51.07 | 38.68 | 82.47 | 6049 | 15 |
| 72.784042 | 30.06 | 45.56 | 26.78 | 69.47 | 6050 | 7 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 72.854828 | 30.14 | 47.70 | 25.42 | 70.10 | 6042 | 7 |
| 72.925728 | 35.14 | 47.31 | 42.95 | 82.96 | 6058 | 9 |
| 72.980530 | 40.80 | 55.70 | 55.63 | 100.04 | 3315 | 9 |
| 73.015266 | 42.62 | 72.31 | 52.58 | 108.31 | 2603 | 12 |
| 73.065964 | 44.85 | 65.91 | 43.18 | 100.28 | 6054 | 12 |
| 73.136757 | 39.68 | 80.90 | 47.15 | 111.80 | 6051 | 5 |
| 73.207619 | 38.11 | 64.62 | 24.71 | 85.96 | 6057 | 5 |
| 73.278458 | 36.61 | 47.34 | 16.28 | 67.11 | 6057 | 2 |
| 73.349297 | 31.29 | 45.77 | 20.83 | 66.01 | 6057 | 2 |
| 73.420151 | 27.26 | 43.85 | 22.17 | 63.00 | 6043 | 0 |
| 73.490974 | 29.70 | 45.36 | 23.47 | 67.32 | 6054 | 0 |
| 73.561783 | 32.42 | 49.42 | 24.10 | 71.24 | 6055 | 0 |
| 73.632614 | 34.25 | 47.99 | 23.60 | 71.24 | 6051 | 0 |
| 73.703484 | 31.78 | 45.99 | 24.86 | 69.19 | 6049 | 0 |
| 73.774330 | 28.90 | 44.22 | 26.96 | 67.49 | 6052 | 6 |
| 73.845161 | 29.97 | 41.22 | 40.01 | 75.68 | 6051 | 6 |
| 73.915993 | 34.60 | 42.93 | 47.10 | 84.57 | 6056 | 6 |
| 73.975685 | 42.20 | 50.60 | 54.14 | 97.25 | 4144 | 6 |
| 74.010414 | 33.78 | 41.33 | 31.57 | 70.38 | 1777 | 7 |
| 74.056252 | 41.91 | 54.55 | 38.64 | 90.14 | 6052 | 7 |
| 74.127075 | 41.95 | 56.18 | 35.03 | 87.47 | 6056 | 6 |
| 74.197906 | 41.81 | 64.22 | 34.58 | 90.97 | 6059 | 6 |
| 74.268753 | 38.69 | 61.64 | 23.34 | 82.26 | 6055 | 4 |
| 74.339561 | 30.78 | 55.05 | 29.53 | 76.91 | 6060 | 4 |
| 74.410416 | 27.66 | 53.91 | 31.39 | 77.78 | 6052 | 6 |
| 74.481247 | 28.75 | 45.87 | 31.37 | 71.37 | 6049 | 6 |
| 74.552063 | 32.25 | 51.56 | 26.90 | 74.42 | 6043 | 4 |
| 74.620407 | 32.84 | 53.69 | 34.69 | 80.43 | 5370 | 4 |
| 74.693260 | 30.95 | 47.45 | 28.52 | 73.85 | 4562 | 5 |
| 74.764275 | 33.65 | 51.29 | 26.96 | 75.48 | 5172 | 6 |
| 74.835777 | 33.53 | 47.92 | 33.86 | 78.40 | 5341 | 6 |
| 74.906479 | 34.43 | 48.60 | 48.87 | 88.77 | 6000 | 6 |
| 74.970848 | 36.89 | 50.20 | 38.76 | 84.60 | 4979 | 6 |
| 75.005577 | 32.58 | 54.93 | 12.42 | 66.65 | 950 | 3 |
| 75.046539 | 34.75 | 53.43 | 37.00 | 83.61 | 6046 | 3 |
| 75.117363 | 35.91 | 60.29 | 34.29 | 87.68 | 6059 | 3 |
| 75.188194 | 36.27 | 55.17 | 27.30 | 79.38 | 6058 | 0 |
| 75.259026 | 33.19 | 56.34 | 20.98 | 74.86 | 6052 | 2 |
| 75.329865 | 28.55 | 58.09 | 23.83 | 75.78 | 6062 | 2 |
| 75.477150 | 25.66 | 53.09 | 21.92 | 68.75 | 5091 | 2 |
| 75.542374 | 30.96 | 50.77 | 22.66 | 70.44 | 6037 | 2 |
| 75.613182 | 34.83 | 51.84 | 23.50 | 74.21 | 6052 | 2 |
| 75.684013 | 33.04 | 45.31 | 23.03 | 68.78 | 6045 | 3 |
| 75.754883 | 32.97 | 42.37 | 27.99 | 69.18 | 6048 | 2 |
| 75.825706 | 31.57 | 45.53 | 28.39 | 71.12 | 6055 | 2 |
| 75.896553 | 32.21 | 47.80 | 30.98 | 74.49 | 6053 | 0 |
| 75.965996 | 33.91 | 48.83 | 26.35 | 73.88 | 5814 | 0 |
| 76.000717 | 25.05 | 76.40 | 18.86 | 82.75 | 117 | 0 |
| 76.036819 | 32.02 | 52.42 | 27.57 | 76.18 | 6053 | 0 |
| 76.107651 | 32.76 | 55.39 | 30.52 | 79.58 | 6051 | 0 |
| 76.178474 | 34.08 | 54.32 | 29.22 | 78.60 | 6058 | 0 |
| 76.249306 | 30.56 | 47.32 | 18.69 | 65.38 | 6059 | 0 |
| 76.320137 | 27.02 | 44.41 | 23.11 | 63.47 | 6056 | 0 |
| 76.391029 | 23.67 | 42.81 | 17.91 | 57.81 | 6044 | 2 |
| 76.461784 | 25.92 | 45.00 | 17.26 | 60.44 | 6039 | 2 |
| 76.532661 | 29.16 | 43.94 | 22.44 | 63.86 | 5097 | 2 |
| 76.608887 | 31.50 | 47.50 | 24.80 | 69.59 | 5119 | 2 |
| 76.674332 | 31.84 | 48.90 | 25.79 | 72.12 | 6043 | 3 |
| 76.745148 | 31.98 | 48.03 | 25.94 | 71.09 | 6042 | 3 |
| 76.815994 | 30.90 | 49.47 | 25.88 | 71.43 | 6055 | 3 |
| 76.886818 | 30.71 | 50.74 | 32.45 | 75.86 | 6050 | 4 |
| 76.957672 | 31.71 | 49.88 | 28.29 | 74.48 | 6055 | 4 |
| 76.996529 | 40.97 | 41.47 | 18.20 | 69.04 | 592 | 4 |
| 77.031410 | 29.42 | 52.93 | 29.53 | 77.28 | 5182 | 7 |
| 77.097214 | 31.50 | 58.03 | 32.09 | 81.55 | 6051 | 7 |
| 77.168053 | 32.65 | 57.73 | 31.46 | 82.29 | 6060 | 5 |
| 77.238899 | 28.82 | 51.19 | 20.87 | 69.69 | 6050 | 5 |
| 77.309723 | 25.77 | 50.32 | 23.85 | 67.77 | 6058 | 6 |
| 77.380569 | 24.53 | 48.39 | 23.03 | 65.58 | 6061 | 6 |
| 77.451401 | 25.03 | 56.99 | 28.05 | 75.02 | 6049 | 6 |
| 77.522224 | 27.24 | 48.97 | 21.26 | 66.23 | 6048 | 6 |

| | | | | | | |
|-----------|-------|-------|--------|--------|------|----|
| 77.593063 | 34.35 | 50.75 | 27.04 | 74.97 | 6052 | 6 |
| 77.663910 | 32.94 | 54.82 | 20.69 | 73.72 | 6054 | 2 |
| 77.734741 | 32.48 | 53.12 | 29.57 | 75.94 | 6044 | 2 |
| 77.805588 | 32.43 | 50.75 | 29.99 | 75.39 | 6045 | 2 |
| 77.876411 | 31.09 | 52.30 | 34.56 | 78.09 | 6058 | 0 |
| 77.947258 | 32.63 | 52.75 | 29.71 | 77.52 | 6058 | 0 |
| 77.991356 | 48.36 | 56.98 | 37.21 | 93.92 | 1484 | 0 |
| 78.026085 | 27.46 | 52.35 | 26.66 | 73.00 | 4447 | 0 |
| 78.087486 | 31.34 | 57.48 | 30.60 | 80.75 | 6044 | 0 |
| 78.158333 | 32.97 | 61.54 | 27.62 | 82.80 | 6060 | 2 |
| 78.229141 | 29.88 | 50.83 | 17.69 | 67.54 | 6055 | 2 |
| 78.300003 | 26.95 | 47.00 | 21.67 | 65.57 | 6054 | 2 |
| 78.370819 | 24.55 | 47.46 | 21.61 | 65.40 | 6048 | 2 |
| 78.441658 | 24.66 | 48.82 | 21.29 | 64.97 | 6048 | 6 |
| 78.512497 | 28.24 | 49.05 | 21.86 | 66.82 | 6047 | 6 |
| 78.583321 | 32.14 | 58.50 | 27.66 | 79.96 | 6053 | 6 |
| 78.654190 | 31.84 | 53.49 | 32.26 | 79.54 | 6049 | 7 |
| 78.725014 | 34.22 | 53.25 | 30.62 | 81.02 | 6043 | 7 |
| 78.795868 | 32.53 | 48.55 | 40.10 | 82.40 | 6052 | 15 |
| 78.866722 | 30.41 | 50.60 | 48.10 | 87.62 | 6052 | 15 |
| 78.937500 | 32.76 | 54.96 | 32.37 | 82.28 | 6049 | 6 |
| 78.986473 | 43.91 | 57.78 | 52.81 | 99.65 | 2311 | 6 |
| 79.021225 | 27.40 | 56.76 | 26.98 | 77.98 | 3617 | 7 |
| 79.077782 | 35.31 | 64.87 | 39.19 | 92.36 | 6049 | 7 |
| 79.148613 | 31.64 | 71.60 | 37.64 | 97.67 | 6057 | 15 |
| 79.219437 | 31.29 | 70.27 | 33.26 | 93.43 | 6056 | 15 |
| 79.290276 | 28.98 | 71.15 | 35.38 | 95.85 | 6060 | 7 |
| 79.361137 | 27.18 | 58.38 | 41.82 | 87.14 | 6053 | 7 |
| 79.431969 | 25.10 | 58.77 | 36.54 | 82.96 | 6052 | 6 |
| 79.502792 | 26.95 | 51.65 | 34.00 | 77.10 | 6045 | 7 |
| 79.573624 | 31.16 | 48.34 | 33.71 | 79.62 | 6052 | 7 |
| 79.644455 | 31.41 | 52.12 | 25.55 | 75.08 | 6050 | 6 |
| 79.715324 | 35.40 | 51.53 | 28.79 | 79.45 | 6043 | 6 |
| 79.786133 | 32.32 | 52.69 | 31.86 | 78.35 | 6051 | 6 |
| 79.856972 | 31.58 | 54.37 | 30.76 | 79.20 | 6050 | 6 |
| 79.927803 | 34.15 | 54.90 | 33.86 | 82.65 | 6056 | 4 |
| 79.981598 | 42.31 | 47.55 | 49.50 | 90.57 | 3141 | 4 |
| 80.016365 | 26.63 | 69.02 | 28.56 | 87.13 | 2784 | 4 |
| 80.068054 | 33.50 | 68.20 | 52.22 | 104.38 | 6048 | 4 |
| 80.138901 | 31.82 | 77.75 | 73.00 | 128.05 | 6042 | 2 |
| 80.209709 | 33.08 | 65.67 | 78.34 | 124.20 | 6055 | 2 |
| 80.280533 | 31.48 | 52.69 | 80.31 | 113.05 | 6050 | 5 |
| 80.351410 | 28.88 | 51.05 | 90.84 | 117.60 | 6059 | 5 |
| 80.422241 | 30.58 | 68.00 | 100.70 | 136.67 | 6050 | 15 |
| 80.493057 | 31.57 | 56.35 | 51.53 | 93.94 | 6054 | 15 |
| 80.563873 | 36.04 | 51.18 | 34.55 | 79.97 | 6053 | 12 |
| 80.634720 | 39.16 | 54.68 | 32.01 | 84.55 | 6051 | 3 |
| 80.705582 | 36.64 | 60.32 | 25.90 | 83.31 | 6054 | 3 |
| 80.776390 | 35.28 | 56.94 | 29.52 | 81.44 | 6045 | 2 |
| 80.847260 | 33.45 | 56.75 | 23.27 | 78.53 | 6055 | 2 |
| 80.918068 | 34.94 | 55.13 | 25.59 | 80.73 | 6046 | 3 |
| 80.956490 | 45.68 | 43.16 | 10.57 | 72.26 | 513 | 3 |
| 81.058876 | 34.71 | 62.54 | 23.44 | 84.55 | 5954 | 2 |
| 81.129181 | 31.37 | 61.21 | 23.14 | 82.21 | 6055 | 2 |
| 81.199989 | 31.61 | 56.34 | 22.71 | 77.77 | 6056 | 2 |
| 81.267883 | 31.38 | 56.16 | 21.66 | 78.32 | 5540 | 5 |
| 81.341850 | 28.28 | 48.29 | 20.90 | 69.22 | 6023 | 5 |
| 81.412514 | 28.11 | 47.78 | 26.54 | 68.95 | 6057 | 3 |
| 81.483353 | 30.60 | 49.27 | 21.70 | 69.73 | 6045 | 3 |
| 81.554146 | 35.46 | 57.00 | 24.10 | 79.49 | 6039 | 6 |
| 81.624985 | 37.97 | 55.25 | 23.34 | 79.65 | 6048 | 6 |
| 81.695847 | 33.79 | 68.91 | 23.46 | 87.85 | 6048 | 6 |
| 81.766716 | 32.18 | 56.59 | 34.60 | 82.53 | 6048 | 5 |
| 81.837509 | 31.88 | 58.61 | 24.50 | 80.08 | 6046 | 5 |
| 81.908371 | 33.46 | 59.88 | 26.92 | 82.28 | 6055 | 0 |
| 81.971863 | 36.12 | 68.37 | 27.54 | 93.17 | 4792 | 0 |
| 82.006607 | 31.37 | 25.73 | 13.46 | 46.33 | 1129 | 6 |
| 82.048622 | 34.28 | 63.37 | 27.76 | 87.15 | 6047 | 6 |
| 82.119431 | 31.72 | 65.32 | 30.63 | 89.09 | 6055 | 6 |
| 82.190300 | 34.12 | 64.93 | 39.68 | 93.46 | 6056 | 9 |
| 82.261101 | 29.85 | 53.55 | 29.75 | 77.64 | 6059 | 12 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 82.331947 | 26.55 | 61.99 | 32.32 | 84.64 | 6059 | 12 |
| 82.402718 | 28.50 | 63.42 | 29.47 | 84.14 | 6042 | 7 |
| 82.473610 | 29.31 | 59.83 | 31.06 | 81.64 | 6053 | 7 |
| 82.544418 | 33.56 | 58.38 | 39.05 | 86.97 | 6037 | 15 |
| 82.615288 | 35.72 | 74.65 | 45.16 | 107.92 | 6047 | 15 |
| 82.686172 | 30.22 | 69.54 | 48.85 | 102.20 | 6043 | 18 |
| 82.756989 | 29.19 | 61.31 | 50.80 | 96.39 | 6038 | 18 |
| 82.827827 | 30.27 | 64.23 | 37.74 | 88.81 | 6052 | 18 |
| 82.898659 | 33.14 | 51.30 | 35.31 | 82.62 | 6048 | 12 |
| 82.967049 | 34.71 | 66.43 | 48.04 | 100.17 | 5625 | 12 |
| 83.001747 | 34.63 | 83.13 | 29.61 | 95.22 | 295 | 15 |
| 83.038887 | 34.15 | 61.33 | 33.68 | 88.90 | 6053 | 15 |
| 83.109734 | 34.47 | 65.31 | 48.71 | 101.06 | 6053 | 15 |
| 83.180565 | 32.55 | 63.26 | 38.33 | 90.96 | 6059 | 18 |
| 83.251373 | 31.76 | 68.47 | 30.16 | 92.81 | 6057 | 12 |
| 83.322220 | 29.44 | 68.73 | 32.11 | 92.04 | 6049 | 12 |
| 83.393059 | 28.30 | 53.49 | 33.53 | 80.11 | 6058 | 15 |
| 83.463890 | 29.60 | 58.84 | 32.25 | 81.88 | 6057 | 15 |
| 83.534714 | 33.89 | 57.03 | 51.25 | 95.31 | 6046 | 22 |
| 83.605545 | 36.14 | 62.69 | 37.40 | 94.07 | 6052 | 22 |
| 83.676399 | 33.49 | 64.09 | 51.92 | 101.32 | 6049 | 18 |
| 83.717766 | 33.02 | 60.83 | 21.68 | 77.98 | 1009 | 18 |
| 84.276932 | 22.08 | 55.62 | 52.85 | 79.85 | 26 | 5 |
| 84.312515 | 28.42 | 53.30 | 28.69 | 78.18 | 6054 | 5 |
| 84.383347 | 27.37 | 47.39 | 21.64 | 67.01 | 6061 | 15 |
| 84.454193 | 27.72 | 52.17 | 19.61 | 70.43 | 6056 | 15 |
| 84.524979 | 37.27 | 60.08 | 52.93 | 102.07 | 6040 | 22 |
| 84.595825 | 36.76 | 67.04 | 51.64 | 106.74 | 6040 | 22 |
| 84.666679 | 35.70 | 54.25 | 36.03 | 86.21 | 6056 | 18 |
| 84.737534 | 34.85 | 59.09 | 35.65 | 85.87 | 6048 | 18 |
| 84.808342 | 36.00 | 57.34 | 27.09 | 83.26 | 6049 | 5 |
| 84.879181 | 33.02 | 64.69 | 39.68 | 90.52 | 6053 | 6 |
| 84.950020 | 36.31 | 61.54 | 34.71 | 89.42 | 6052 | 6 |
| 84.992706 | 41.94 | 61.32 | 21.84 | 85.68 | 1247 | 6 |
| 85.027466 | 34.93 | 55.70 | 39.65 | 88.74 | 4682 | 7 |
| 85.090279 | 36.60 | 57.65 | 37.56 | 87.84 | 6054 | 7 |
| 85.172775 | 26.23 | 71.21 | 35.63 | 93.70 | 3912 | 9 |
| 85.231956 | 32.21 | 61.91 | 28.56 | 86.36 | 6055 | 9 |
| 85.302803 | 31.34 | 62.09 | 36.88 | 90.91 | 6054 | 9 |
| 85.373627 | 28.42 | 49.61 | 27.09 | 73.00 | 6060 | 9 |
| 85.444458 | 29.32 | 61.02 | 35.90 | 87.83 | 6054 | 6 |
| 85.515259 | 32.88 | 49.68 | 34.15 | 76.27 | 6047 | 5 |
| 85.586090 | 40.24 | 58.82 | 16.06 | 80.87 | 6049 | 5 |
| 85.656937 | 35.36 | 62.81 | 28.86 | 87.29 | 6055 | 15 |
| 85.727814 | 36.56 | 54.60 | 44.30 | 91.18 | 6049 | 15 |
| 85.798645 | 33.04 | 66.05 | 28.21 | 85.78 | 6053 | 12 |
| 85.869492 | 32.33 | 60.26 | 30.57 | 84.11 | 6050 | 12 |
| 85.940315 | 35.46 | 56.31 | 27.03 | 82.02 | 6053 | 2 |
| 85.987862 | 54.08 | 51.55 | 24.42 | 91.29 | 2075 | 2 |
| 86.022614 | 25.17 | 60.68 | 29.28 | 78.73 | 3854 | 2 |
| 86.080544 | 37.24 | 60.55 | 33.97 | 89.16 | 6055 | 2 |
| 86.151413 | 34.32 | 66.75 | 29.81 | 90.18 | 6059 | 0 |
| 86.222221 | 32.71 | 53.30 | 24.19 | 76.81 | 6060 | 0 |
| 86.293068 | 31.69 | 49.02 | 24.38 | 76.30 | 6057 | 3 |
| 86.363914 | 29.53 | 45.68 | 22.35 | 67.88 | 6056 | 3 |
| 86.434746 | 28.91 | 48.75 | 21.24 | 68.92 | 6053 | 3 |
| 86.505554 | 32.98 | 49.44 | 19.52 | 70.54 | 6054 | 3 |
| 86.576363 | 36.11 | 53.29 | 20.75 | 74.76 | 6053 | 3 |
| 86.647209 | 36.88 | 55.99 | 30.30 | 85.83 | 6053 | 6 |
| 86.718086 | 35.05 | 56.33 | 34.12 | 83.87 | 6048 | 6 |
| 86.788925 | 33.53 | 53.37 | 32.83 | 80.90 | 6053 | 5 |
| 86.859779 | 32.14 | 60.84 | 28.61 | 81.88 | 6054 | 5 |
| 86.931305 | 35.30 | 64.31 | 41.90 | 94.86 | 5912 | 5 |
| 86.982971 | 42.92 | 45.97 | 24.51 | 77.74 | 2902 | 5 |
| 87.017731 | 29.04 | 74.45 | 33.79 | 97.23 | 3020 | 4 |
| 87.070824 | 37.01 | 61.38 | 29.62 | 86.67 | 6051 | 4 |
| 87.141678 | 33.91 | 70.19 | 32.03 | 95.71 | 6063 | 5 |
| 87.212502 | 33.96 | 55.65 | 33.89 | 82.92 | 6057 | 5 |
| 87.283310 | 32.78 | 52.12 | 33.10 | 82.48 | 6046 | 4 |
| 87.354156 | 29.17 | 44.26 | 20.93 | 66.94 | 6048 | 4 |
| 87.424980 | 29.35 | 50.42 | 21.21 | 70.83 | 6046 | 3 |

| | | | | | | |
|-----------|-------|--------|-------|--------|------|----|
| 87.495834 | 32.90 | 51.21 | 25.25 | 74.23 | 6051 | 3 |
| 87.566635 | 36.61 | 53.23 | 18.32 | 74.37 | 6048 | 5 |
| 87.637466 | 33.64 | 53.54 | 25.43 | 75.61 | 6048 | 3 |
| 87.708382 | 30.51 | 49.39 | 35.17 | 76.86 | 6046 | 3 |
| 87.779213 | 27.04 | 43.87 | 32.14 | 68.80 | 6050 | 3 |
| 87.850044 | 28.53 | 45.52 | 28.07 | 69.15 | 6049 | 3 |
| 87.920845 | 32.28 | 49.92 | 34.83 | 76.68 | 6054 | 4 |
| 87.959053 | 29.42 | 44.71 | 16.85 | 65.01 | 475 | 4 |
| 88.061470 | 36.30 | 56.38 | 37.64 | 85.70 | 5983 | 6 |
| 88.131966 | 36.06 | 54.64 | 34.61 | 83.71 | 6054 | 6 |
| 88.202766 | 34.93 | 66.04 | 35.60 | 92.52 | 6059 | 6 |
| 88.273613 | 32.48 | 58.93 | 29.97 | 81.98 | 6060 | 5 |
| 88.344444 | 28.09 | 54.04 | 24.74 | 72.69 | 6061 | 5 |
| 88.415268 | 26.91 | 48.24 | 32.50 | 72.45 | 6054 | 5 |
| 88.486504 | 27.13 | 48.74 | 26.37 | 70.00 | 5878 | 5 |
| 88.556969 | 32.33 | 49.74 | 26.16 | 73.28 | 6046 | 3 |
| 88.627769 | 33.48 | 55.02 | 26.76 | 77.48 | 6057 | 3 |
| 88.698647 | 29.52 | 48.74 | 27.95 | 71.09 | 6052 | 3 |
| 88.769470 | 27.41 | 44.18 | 33.02 | 69.05 | 6046 | 2 |
| 88.840309 | 28.58 | 47.87 | 35.43 | 75.60 | 6055 | 2 |
| 88.911156 | 31.81 | 49.18 | 34.40 | 76.29 | 6058 | 0 |
| 88.973267 | 35.32 | 57.71 | 39.25 | 88.11 | 4563 | 0 |
| 89.007996 | 34.17 | 25.44 | 12.39 | 47.95 | 1368 | 2 |
| 89.051392 | 34.83 | 55.74 | 37.23 | 85.37 | 6053 | 2 |
| 89.122231 | 35.66 | 56.38 | 32.22 | 83.13 | 6053 | 2 |
| 89.193054 | 36.18 | 48.20 | 24.87 | 72.41 | 6051 | 2 |
| 89.263901 | 34.32 | 42.86 | 22.98 | 66.85 | 6061 | 3 |
| 89.334724 | 29.93 | 42.10 | 23.00 | 64.27 | 6053 | 3 |
| 89.405563 | 31.37 | 44.65 | 19.10 | 65.78 | 6056 | 4 |
| 89.476379 | 27.66 | 47.20 | 28.37 | 70.74 | 6051 | 4 |
| 89.547218 | 31.42 | 48.37 | 27.95 | 72.55 | 6051 | 4 |
| 89.618057 | 33.10 | 52.34 | 30.23 | 77.14 | 6054 | 4 |
| 89.688904 | 28.62 | 68.94 | 33.89 | 89.91 | 6047 | 4 |
| 89.759766 | 24.55 | 51.17 | 44.20 | 81.30 | 6047 | 27 |
| 89.830605 | 25.50 | 54.42 | 61.39 | 96.38 | 6047 | 27 |
| 89.901436 | 33.93 | 53.56 | 53.82 | 96.90 | 6055 | 32 |
| 89.968430 | 39.64 | 73.05 | 53.64 | 112.09 | 5391 | 32 |
| 90.003136 | 47.47 | 69.34 | 12.60 | 86.43 | 534 | 15 |
| 90.041664 | 36.37 | 56.05 | 37.58 | 86.82 | 6052 | 15 |
| 90.112549 | 37.63 | 53.40 | 36.90 | 84.78 | 6045 | 15 |
| 90.183319 | 35.88 | 57.54 | 31.97 | 83.31 | 6058 | 9 |
| 90.254158 | 35.39 | 48.25 | 22.72 | 69.82 | 6059 | 7 |
| 90.324989 | 30.31 | 48.19 | 24.42 | 69.87 | 6048 | 7 |
| 90.395859 | 28.31 | 51.18 | 31.30 | 74.65 | 6046 | 4 |
| 90.466652 | 28.75 | 50.93 | 31.77 | 74.63 | 6048 | 4 |
| 90.537498 | 32.15 | 49.01 | 29.09 | 74.56 | 6042 | 9 |
| 90.608345 | 33.98 | 52.40 | 42.77 | 85.42 | 6045 | 9 |
| 90.679192 | 29.30 | 48.87 | 39.55 | 77.69 | 6051 | 9 |
| 90.750061 | 26.28 | 52.35 | 53.72 | 90.27 | 6039 | 32 |
| 90.820877 | 31.87 | 64.27 | 69.65 | 115.66 | 6040 | 32 |
| 90.891678 | 32.40 | 58.22 | 56.96 | 100.25 | 6043 | 15 |
| 90.962509 | 39.23 | 49.57 | 36.23 | 83.69 | 6044 | 15 |
| 90.998947 | 23.11 | 92.61 | 14.06 | 96.93 | 175 | 15 |
| 91.033707 | 48.14 | 52.18 | 39.16 | 90.95 | 5751 | 18 |
| 91.102776 | 42.72 | 66.24 | 66.48 | 116.21 | 6048 | 18 |
| 91.173622 | 38.38 | 77.90 | 52.18 | 115.69 | 6061 | 39 |
| 91.244453 | 40.22 | 75.14 | 50.45 | 108.55 | 6036 | 39 |
| 91.315292 | 32.79 | 110.88 | 64.02 | 144.44 | 6057 | 22 |
| 91.386124 | 36.22 | 76.15 | 66.88 | 117.86 | 6058 | 22 |
| 91.456947 | 34.95 | 73.48 | 69.92 | 119.16 | 6045 | 22 |
| 91.527756 | 38.85 | 75.29 | 62.80 | 119.46 | 6042 | 32 |
| 91.598625 | 35.13 | 78.28 | 67.47 | 121.41 | 6043 | 32 |
| 91.669441 | 35.22 | 72.22 | 59.18 | 114.52 | 6048 | 12 |
| 91.740288 | 33.61 | 66.31 | 51.16 | 103.96 | 6044 | 12 |
| 91.811134 | 37.94 | 63.88 | 48.63 | 103.97 | 6052 | 18 |
| 91.881043 | 41.62 | 58.28 | 62.19 | 107.97 | 6052 | 22 |
| 91.952789 | 48.76 | 53.05 | 54.92 | 103.94 | 6050 | 22 |
| 91.994095 | 34.47 | 48.74 | 77.84 | 119.43 | 1009 | 22 |
| 92.028831 | 52.53 | 54.27 | 50.00 | 101.18 | 4920 | 12 |
| 92.093056 | 51.54 | 62.34 | 47.25 | 105.01 | 6051 | 12 |
| 92.163887 | 47.38 | 67.78 | 35.90 | 99.11 | 6058 | 9 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 92.234711 | 45.20 | 76.93 | 42.83 | 108.36 | 6052 | 9 |
| 92.305557 | 39.76 | 53.55 | 28.06 | 80.48 | 6060 | 6 |
| 92.376404 | 36.77 | 50.12 | 26.94 | 76.06 | 6053 | 7 |
| 92.447220 | 31.59 | 53.46 | 26.69 | 75.41 | 6059 | 7 |
| 92.518044 | 36.98 | 55.57 | 31.18 | 83.16 | 6049 | 7 |
| 92.588890 | 35.98 | 58.67 | 29.13 | 84.69 | 6046 | 7 |
| 92.659714 | 38.14 | 52.60 | 35.35 | 84.51 | 6047 | 18 |
| 92.730598 | 43.47 | 62.41 | 54.99 | 107.76 | 6035 | 18 |
| 92.801414 | 37.37 | 67.96 | 54.06 | 109.00 | 6042 | 27 |
| 92.872246 | 34.58 | 51.30 | 49.13 | 92.74 | 6060 | 27 |
| 92.943100 | 42.43 | 63.41 | 61.49 | 110.72 | 6048 | 18 |
| 92.989212 | 63.89 | 72.52 | 96.45 | 155.09 | 1830 | 18 |
| 93.023994 | 44.01 | 68.53 | 77.96 | 125.09 | 4087 | 27 |
| 93.083344 | 56.25 | 95.95 | 87.35 | 158.77 | 6041 | 27 |
| 93.154167 | 52.03 | 84.32 | 78.94 | 140.91 | 6059 | 22 |
| 93.224945 | 43.76 | 91.04 | 53.26 | 124.32 | 6051 | 22 |
| 93.295883 | 38.50 | 89.64 | 56.33 | 125.91 | 6051 | 18 |
| 93.366676 | 34.40 | 57.07 | 47.87 | 92.02 | 6060 | 18 |
| 93.437515 | 30.27 | 56.16 | 41.89 | 85.45 | 6059 | 12 |
| 93.508354 | 43.71 | 85.69 | 99.90 | 154.07 | 6039 | 15 |
| 93.579170 | 36.27 | 63.74 | 60.23 | 109.67 | 6048 | 15 |
| 93.650002 | 37.33 | 57.62 | 28.70 | 83.79 | 6057 | 5 |
| 93.720871 | 38.42 | 60.52 | 33.49 | 86.99 | 6046 | 5 |
| 93.791687 | 38.87 | 61.98 | 43.77 | 95.90 | 6052 | 7 |
| 93.862549 | 34.77 | 64.26 | 42.13 | 96.24 | 6056 | 7 |
| 93.933388 | 39.38 | 65.05 | 65.64 | 113.57 | 6053 | 15 |
| 93.984360 | 53.13 | 73.12 | 59.33 | 117.53 | 2665 | 15 |
| 94.019157 | 34.46 | 80.22 | 54.21 | 118.99 | 3258 | 12 |
| 94.073608 | 45.57 | 71.59 | 53.00 | 113.02 | 6057 | 12 |
| 94.144409 | 39.79 | 83.34 | 53.31 | 118.04 | 6049 | 12 |
| 94.215263 | 37.96 | 89.44 | 47.05 | 120.92 | 6051 | 12 |
| 94.286125 | 34.67 | 76.97 | 33.97 | 102.64 | 6060 | 6 |
| 94.356934 | 31.80 | 56.21 | 30.71 | 81.66 | 6053 | 6 |
| 94.427780 | 30.99 | 65.96 | 52.11 | 105.06 | 6060 | 6 |
| 94.498611 | 33.74 | 63.29 | 46.40 | 97.29 | 6054 | 6 |
| 94.569435 | 35.45 | 64.80 | 35.70 | 92.94 | 6055 | 7 |
| 94.640282 | 34.92 | 66.55 | 40.34 | 97.42 | 6057 | 9 |
| 94.711136 | 34.82 | 59.93 | 26.81 | 83.01 | 6055 | 9 |
| 94.781921 | 34.84 | 57.75 | 29.20 | 80.72 | 6046 | 5 |
| 94.852844 | 32.99 | 60.14 | 33.62 | 83.72 | 6042 | 5 |
| 94.923637 | 37.61 | 57.51 | 60.60 | 105.03 | 6058 | 15 |
| 94.979515 | 40.16 | 77.94 | 52.64 | 112.79 | 3489 | 15 |
| 95.014252 | 44.59 | 78.87 | 98.88 | 148.27 | 2436 | 48 |
| 95.063873 | 45.39 | 86.23 | 79.69 | 137.71 | 6048 | 48 |
| 95.134758 | 41.70 | 91.36 | 62.58 | 130.87 | 6046 | 22 |
| 95.205528 | 39.34 | 61.54 | 30.33 | 88.91 | 6056 | 22 |
| 95.276375 | 37.08 | 51.32 | 22.17 | 77.01 | 6053 | 9 |
| 95.347221 | 32.02 | 53.40 | 22.60 | 75.51 | 6060 | 9 |
| 95.418053 | 31.76 | 47.77 | 19.53 | 69.97 | 6059 | 5 |
| 95.488899 | 34.92 | 50.04 | 21.46 | 71.80 | 6053 | 5 |
| 95.559708 | 37.48 | 63.82 | 57.81 | 109.61 | 6050 | 22 |
| 95.630531 | 37.94 | 68.28 | 51.85 | 111.53 | 6052 | 15 |
| 95.701408 | 39.23 | 74.75 | 56.72 | 121.86 | 6053 | 15 |
| 95.772247 | 40.61 | 88.63 | 50.96 | 124.57 | 6053 | 39 |
| 95.843117 | 38.71 | 77.59 | 54.80 | 122.52 | 6041 | 39 |
| 95.913925 | 39.15 | 73.49 | 50.08 | 109.91 | 6059 | 15 |
| 95.974640 | 48.13 | 77.27 | 45.99 | 115.32 | 4317 | 15 |
| 96.009377 | 33.73 | 70.63 | 62.72 | 109.68 | 1602 | 27 |
| 96.054169 | 44.31 | 89.13 | 55.92 | 128.23 | 6041 | 27 |
| 96.125038 | 42.60 | 97.41 | 57.16 | 134.20 | 6049 | 32 |
| 96.195831 | 40.30 | 92.91 | 42.22 | 123.32 | 6052 | 32 |
| 96.266655 | 38.74 | 56.03 | 22.80 | 81.68 | 6057 | 6 |
| 96.337479 | 33.33 | 47.40 | 18.09 | 68.74 | 6054 | 6 |
| 96.408333 | 31.55 | 44.75 | 21.45 | 68.43 | 6059 | 3 |
| 96.479164 | 33.90 | 47.56 | 23.05 | 72.40 | 6049 | 3 |
| 96.510000 | 30.15 | 50.47 | 28.07 | 79.52 | 6049 | 3 |
| 96.620819 | 41.10 | 54.21 | 25.95 | 82.81 | 6054 | 3 |
| 96.695915 | 27.36 | 50.02 | 22.10 | 69.75 | 4800 | 6 |
| 96.762497 | 32.29 | 62.88 | 42.75 | 90.89 | 6047 | 5 |
| 96.833359 | 33.66 | 58.75 | 35.57 | 84.49 | 6052 | 5 |
| 96.904167 | 36.72 | 64.69 | 37.56 | 92.58 | 6052 | 4 |

| | | | | | | |
|------------|--------|--------|--------|--------|------|-----|
| 96.969795 | 39.27 | 59.12 | 29.70 | 87.90 | 5157 | 4 |
| 97.004517 | 44.79 | 63.92 | 32.33 | 86.25 | 770 | 6 |
| 97.044434 | 38.56 | 59.23 | 29.97 | 86.48 | 6049 | 6 |
| 97.116051 | 42.24 | 82.44 | 40.29 | 113.62 | 5903 | 6 |
| 97.186134 | 39.63 | 102.28 | 49.80 | 133.16 | 6051 | 32 |
| 97.256943 | 38.86 | 92.43 | 61.51 | 131.18 | 6052 | 12 |
| 97.327759 | 31.86 | 91.93 | 51.16 | 125.08 | 6053 | 12 |
| 97.398613 | 29.64 | 66.14 | 37.89 | 94.84 | 6057 | 9 |
| 97.469444 | 32.36 | 54.74 | 32.17 | 81.54 | 6057 | 9 |
| 97.540268 | 37.39 | 64.44 | 39.93 | 94.05 | 6050 | 18 |
| 97.611115 | 36.82 | 71.05 | 40.52 | 98.55 | 6047 | 18 |
| 97.681946 | 38.21 | 84.61 | 40.44 | 115.23 | 6047 | 111 |
| 97.752815 | 50.32 | 134.32 | 127.49 | 212.29 | 6027 | 236 |
| 97.823654 | 66.87 | 185.43 | 116.20 | 259.41 | 6026 | 236 |
| 97.894386 | 88.43 | 203.06 | 116.11 | 292.65 | 5992 | 236 |
| 97.964973 | 118.18 | 258.01 | 165.21 | 371.70 | 5978 | 236 |
| 98.034790 | 116.33 | 251.59 | 110.56 | 328.07 | 5911 | 300 |
| 98.104836 | 94.04 | 155.28 | 72.71 | 227.81 | 6028 | 300 |
| 98.175789 | 83.81 | 139.76 | 68.79 | 195.74 | 6026 | 80 |
| 98.246620 | 79.48 | 131.02 | 88.82 | 200.15 | 6023 | 80 |
| 98.317398 | 68.15 | 122.95 | 83.04 | 182.38 | 6039 | 80 |
| 98.388184 | 62.84 | 117.00 | 56.57 | 157.75 | 6053 | 27 |
| 98.459053 | 55.86 | 87.47 | 43.02 | 130.87 | 6051 | 27 |
| 98.529846 | 55.76 | 82.21 | 43.18 | 129.14 | 6046 | 27 |
| 98.600708 | 53.53 | 83.20 | 33.70 | 124.15 | 6051 | 27 |
| 98.671532 | 53.53 | 78.36 | 39.15 | 124.55 | 6044 | 32 |
| 98.742409 | 52.62 | 81.30 | 49.55 | 134.09 | 6048 | 32 |
| 98.813240 | 53.71 | 73.39 | 50.68 | 124.73 | 6047 | 22 |
| 98.884071 | 52.16 | 75.19 | 45.68 | 120.15 | 6050 | 22 |
| 98.954964 | 60.03 | 76.64 | 55.14 | 128.39 | 6037 | 22 |
| 98.995125 | 32.27 | 81.46 | 30.74 | 104.38 | 830 | 22 |
| 99.029877 | 60.52 | 64.46 | 41.42 | 111.50 | 5101 | 9 |
| 99.095139 | 58.52 | 73.18 | 47.18 | 117.70 | 6057 | 9 |
| 99.165962 | 55.32 | 63.13 | 46.47 | 109.31 | 6056 | 9 |
| 99.236687 | 53.08 | 69.27 | 60.70 | 122.87 | 6029 | 9 |
| 99.307671 | 42.43 | 84.89 | 60.29 | 128.53 | 6037 | 15 |
| 99.378487 | 39.43 | 83.59 | 69.12 | 131.82 | 6056 | 15 |
| 99.449303 | 37.92 | 52.36 | 56.05 | 99.32 | 6060 | 15 |
| 99.520164 | 39.64 | 63.21 | 60.52 | 111.14 | 6040 | 7 |
| 99.590950 | 41.19 | 64.27 | 53.51 | 109.07 | 6051 | 7 |
| 99.661819 | 38.65 | 59.00 | 49.27 | 101.96 | 6051 | 6 |
| 99.807976 | 43.34 | 47.11 | 58.25 | 101.31 | 5290 | 9 |
| 99.874336 | 40.07 | 52.65 | 58.79 | 105.86 | 6058 | 9 |
| 99.945175 | 48.06 | 54.93 | 60.27 | 110.42 | 6053 | 12 |
| 99.990288 | 66.23 | 66.31 | 73.95 | 138.68 | 1663 | 12 |
| 100.025055 | 41.57 | 51.38 | 39.16 | 86.26 | 4265 | 9 |
| 100.085419 | 50.93 | 66.88 | 47.51 | 107.16 | 6055 | 9 |
| 100.156250 | 47.43 | 66.23 | 39.40 | 99.03 | 6059 | 15 |
| 100.227058 | 45.76 | 55.14 | 31.48 | 85.92 | 6049 | 15 |
| 100.297920 | 42.02 | 39.75 | 21.24 | 69.55 | 6061 | 9 |
| 100.368759 | 36.48 | 47.49 | 32.93 | 77.50 | 6056 | 9 |
| 100.439583 | 33.60 | 52.25 | 37.91 | 82.10 | 6057 | 6 |
| 100.510414 | 36.23 | 55.29 | 47.98 | 92.47 | 6048 | 18 |
| 100.581230 | 38.58 | 67.20 | 47.60 | 101.46 | 6045 | 18 |
| 100.652084 | 35.03 | 66.88 | 57.87 | 107.75 | 6044 | 15 |
| 100.722939 | 35.09 | 59.77 | 53.65 | 101.97 | 6051 | 15 |
| 100.793785 | 36.73 | 62.80 | 42.76 | 96.52 | 6051 | 22 |
| 100.864594 | 39.67 | 63.66 | 60.01 | 111.56 | 6052 | 22 |
| 100.935440 | 46.45 | 67.63 | 61.49 | 116.19 | 6051 | 22 |
| 100.985420 | 58.89 | 80.36 | 53.78 | 129.72 | 2489 | 22 |
| 101.020195 | 46.87 | 76.14 | 74.00 | 130.12 | 3432 | 22 |
| 101.076843 | 56.70 | 80.00 | 68.41 | 135.57 | 5841 | 22 |
| 101.146530 | 52.45 | 94.71 | 71.17 | 143.53 | 6063 | 27 |
| 101.217361 | 43.46 | 112.63 | 66.34 | 149.89 | 6056 | 27 |
| 101.288193 | 42.23 | 88.77 | 55.75 | 127.56 | 6055 | 22 |
| 101.359039 | 35.88 | 79.27 | 60.30 | 120.69 | 6047 | 22 |
| 101.429863 | 32.05 | 69.85 | 54.47 | 105.45 | 6053 | 16 |
| 101.500664 | 34.53 | 51.49 | 42.21 | 86.91 | 6045 | 15 |
| 101.571495 | 36.50 | 60.24 | 40.36 | 93.25 | 6046 | 15 |
| 101.642372 | 37.23 | 60.13 | 42.30 | 95.14 | 6053 | 15 |
| 101.713203 | 37.39 | 55.56 | 39.04 | 91.00 | 6052 | 15 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 101.784073 | 37.09 | 49.36 | 36.36 | 82.99 | 6049 | 12 |
| 101.854881 | 37.37 | 47.18 | 45.05 | 86.10 | 6051 | 12 |
| 101.925720 | 43.95 | 61.82 | 61.62 | 110.36 | 6056 | 18 |
| 101.980545 | 46.21 | 55.48 | 46.19 | 96.71 | 3316 | 18 |
| 102.015289 | 42.86 | 50.97 | 21.00 | 78.80 | 2610 | 6 |
| 102.065971 | 47.96 | 58.86 | 38.75 | 95.12 | 6052 | 6 |
| 102.136818 | 44.00 | 56.79 | 32.85 | 87.59 | 6062 | 15 |
| 102.207649 | 44.60 | 71.35 | 54.19 | 110.09 | 6054 | 15 |
| 102.278481 | 42.15 | 64.79 | 31.65 | 91.37 | 6061 | 18 |
| 102.349319 | 32.06 | 65.81 | 48.17 | 101.31 | 6057 | 18 |
| 102.420135 | 29.42 | 55.35 | 44.72 | 85.98 | 6059 | 6 |
| 102.490974 | 30.73 | 55.54 | 39.79 | 84.47 | 6054 | 6 |
| 102.561806 | 34.17 | 56.67 | 44.00 | 89.68 | 6048 | 7 |
| 102.632629 | 34.63 | 60.80 | 41.58 | 91.46 | 6052 | 6 |
| 102.703491 | 34.87 | 53.83 | 39.23 | 88.20 | 6055 | 6 |
| 102.774338 | 34.81 | 48.01 | 40.23 | 84.39 | 6053 | 9 |
| 102.845177 | 36.78 | 48.39 | 44.09 | 87.85 | 6053 | 9 |
| 102.916008 | 39.75 | 47.57 | 47.45 | 89.54 | 6054 | 5 |
| 102.975693 | 45.60 | 54.10 | 44.22 | 94.10 | 4141 | 5 |
| 103.010429 | 35.71 | 36.36 | 13.82 | 58.78 | 1784 | 9 |
| 103.056252 | 44.62 | 63.62 | 43.84 | 100.69 | 6053 | 9 |
| 103.127083 | 45.25 | 69.22 | 49.04 | 107.20 | 6061 | 12 |
| 103.197914 | 43.71 | 63.23 | 45.16 | 97.75 | 6061 | 12 |
| 103.268776 | 40.20 | 68.84 | 38.22 | 97.09 | 6056 | 9 |
| 103.339569 | 33.69 | 55.42 | 27.52 | 79.97 | 6052 | 9 |
| 103.410431 | 30.84 | 46.98 | 26.44 | 70.41 | 6053 | 2 |
| 103.481262 | 30.25 | 47.70 | 28.39 | 74.12 | 6056 | 2 |
| 103.552071 | 33.67 | 50.01 | 23.84 | 75.03 | 6049 | 4 |
| 103.622902 | 34.75 | 54.90 | 24.96 | 78.31 | 6055 | 4 |
| 103.693764 | 32.84 | 46.41 | 27.69 | 73.76 | 6046 | 6 |
| 103.764603 | 30.23 | 46.45 | 27.32 | 70.56 | 6053 | 5 |
| 103.835426 | 31.54 | 45.06 | 30.17 | 70.98 | 6048 | 5 |
| 103.906273 | 34.91 | 43.61 | 33.46 | 74.19 | 6057 | 6 |
| 103.970856 | 40.37 | 42.66 | 35.62 | 77.58 | 4975 | 6 |
| 104.005569 | 46.18 | 42.67 | 11.35 | 67.71 | 950 | 9 |
| 104.046539 | 44.45 | 55.74 | 46.75 | 96.28 | 6038 | 9 |
| 104.117371 | 48.06 | 68.21 | 53.02 | 109.90 | 6053 | 9 |
| 104.188210 | 41.28 | 66.51 | 41.03 | 96.70 | 6058 | 22 |
| 104.259018 | 42.31 | 58.43 | 29.76 | 85.10 | 6056 | 7 |
| 104.329849 | 34.45 | 61.89 | 44.86 | 96.10 | 6058 | 7 |
| 104.400703 | 31.96 | 52.64 | 30.95 | 77.13 | 6056 | 4 |
| 104.471519 | 30.42 | 58.81 | 30.30 | 83.73 | 6053 | 4 |
| 104.542351 | 33.82 | 51.64 | 30.52 | 80.28 | 6050 | 3 |
| 104.613182 | 35.70 | 55.81 | 24.36 | 80.20 | 6057 | 3 |
| 104.684052 | 34.26 | 48.18 | 24.40 | 74.41 | 6054 | 2 |
| 104.754898 | 30.65 | 47.87 | 28.56 | 71.99 | 6049 | 0 |
| 104.825729 | 34.61 | 43.80 | 28.03 | 72.67 | 6052 | 0 |
| 104.896553 | 34.82 | 52.66 | 31.97 | 79.56 | 6059 | 0 |
| 104.966003 | 37.44 | 53.45 | 28.86 | 80.49 | 5817 | 0 |
| 105.000710 | 22.33 | 88.26 | 22.09 | 93.81 | 117 | 0 |
| 105.036819 | 34.49 | 55.85 | 27.59 | 80.35 | 6052 | 0 |
| 105.107635 | 36.07 | 61.74 | 30.20 | 85.91 | 6054 | 0 |
| 105.178482 | 36.73 | 54.46 | 27.23 | 79.12 | 6055 | 2 |
| 105.249290 | 33.80 | 57.99 | 25.67 | 81.25 | 6058 | 2 |
| 105.320137 | 30.33 | 46.98 | 22.58 | 68.18 | 6056 | 2 |
| 105.390991 | 27.93 | 42.81 | 24.97 | 64.47 | 6054 | 3 |
| 105.461792 | 29.79 | 43.37 | 27.26 | 67.09 | 6053 | 3 |
| 105.532623 | 32.56 | 49.18 | 30.77 | 75.06 | 6047 | 2 |
| 105.603470 | 37.41 | 51.63 | 27.72 | 78.49 | 6052 | 2 |
| 105.674316 | 34.62 | 51.60 | 37.37 | 83.14 | 6054 | 3 |
| 105.745140 | 34.14 | 51.52 | 39.74 | 83.76 | 6043 | 3 |
| 105.815994 | 34.35 | 53.58 | 32.37 | 79.66 | 6050 | 5 |
| 105.886841 | 32.19 | 54.71 | 32.30 | 79.46 | 6057 | 2 |
| 105.957642 | 34.33 | 59.41 | 27.54 | 82.14 | 6048 | 2 |
| 105.996529 | 38.22 | 45.64 | 16.04 | 69.38 | 593 | 2 |
| 106.021255 | 33.35 | 62.88 | 30.82 | 87.22 | 5340 | 2 |
| 106.097908 | 35.19 | 63.43 | 34.09 | 89.69 | 6054 | 2 |
| 106.168762 | 35.92 | 59.82 | 29.43 | 84.38 | 6064 | 4 |
| 106.239586 | 31.46 | 54.55 | 22.10 | 76.02 | 6057 | 4 |
| 106.310417 | 29.13 | 55.38 | 24.79 | 76.96 | 6063 | 4 |
| 106.381264 | 28.27 | 51.31 | 28.03 | 74.12 | 6060 | 6 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 106.452072 | 28.53 | 49.94 | 25.27 | 71.33 | 6058 | 6 |
| 106.522926 | 31.50 | 56.65 | 29.70 | 79.03 | 6042 | 5 |
| 106.593735 | 38.19 | 51.75 | 28.45 | 79.59 | 6057 | 5 |
| 106.664597 | 34.67 | 59.50 | 29.25 | 83.84 | 6053 | 6 |
| 106.735428 | 37.95 | 50.40 | 31.87 | 80.87 | 6050 | 6 |
| 106.806282 | 38.63 | 62.49 | 33.28 | 91.47 | 6052 | 9 |
| 106.877098 | 35.84 | 64.78 | 54.99 | 105.84 | 6054 | 12 |
| 106.947937 | 36.00 | 73.14 | 62.26 | 117.83 | 6053 | 12 |
| 106.991676 | 44.06 | 106.61 | 39.79 | 134.71 | 1427 | 12 |
| 107.026459 | 35.41 | 78.68 | 65.03 | 122.91 | 4503 | 18 |
| 107.088203 | 39.32 | 92.40 | 64.60 | 135.83 | 6049 | 18 |
| 107.159019 | 39.85 | 127.57 | 84.23 | 173.10 | 6048 | 32 |
| 107.229851 | 35.35 | 100.27 | 55.68 | 131.95 | 6059 | 32 |
| 107.300682 | 34.58 | 63.51 | 36.82 | 91.92 | 6052 | 32 |
| 107.371529 | 37.08 | 104.05 | 75.75 | 150.22 | 6048 | 32 |
| 107.442360 | 44.78 | 93.69 | 84.47 | 148.24 | 6055 | 32 |
| 107.513191 | 41.21 | 71.26 | 52.91 | 110.93 | 6047 | 32 |
| 107.584038 | 46.05 | 69.38 | 55.23 | 117.28 | 6042 | 32 |
| 107.654877 | 41.84 | 62.53 | 30.35 | 91.59 | 6053 | 12 |
| 107.725716 | 45.28 | 76.23 | 33.82 | 106.96 | 6049 | 12 |
| 107.796555 | 43.52 | 53.59 | 41.12 | 94.67 | 6052 | 9 |
| 107.867409 | 36.32 | 69.10 | 46.12 | 104.36 | 6053 | 9 |
| 107.938255 | 36.65 | 73.48 | 43.10 | 104.64 | 6040 | 7 |
| 107.986809 | 50.19 | 66.09 | 53.80 | 111.84 | 2253 | 7 |
| 108.021576 | 28.73 | 65.23 | 33.37 | 87.06 | 3677 | 15 |
| 108.078468 | 39.31 | 66.93 | 58.23 | 109.96 | 6053 | 15 |
| 108.149292 | 36.16 | 56.51 | 44.84 | 94.10 | 6059 | 15 |
| 108.220139 | 32.95 | 50.48 | 53.57 | 91.09 | 6055 | 15 |
| 108.290985 | 32.08 | 69.15 | 54.91 | 108.84 | 6055 | 27 |
| 108.361809 | 32.88 | 73.29 | 63.52 | 116.60 | 6057 | 27 |
| 108.432648 | 33.87 | 45.52 | 52.06 | 87.31 | 6059 | 12 |
| 108.503487 | 35.39 | 43.63 | 51.94 | 87.65 | 6054 | 4 |
| 108.575951 | 43.49 | 54.57 | 46.56 | 95.67 | 5699 | 4 |
| 108.645126 | 42.24 | 62.41 | 51.02 | 101.69 | 6055 | 7 |
| 108.791161 | 45.33 | 59.39 | 52.25 | 103.79 | 5315 | 5 |
| 108.857681 | 38.69 | 66.15 | 52.26 | 104.59 | 6052 | 5 |
| 108.928520 | 38.27 | 53.23 | 52.30 | 96.70 | 6060 | 7 |
| 108.981941 | 43.58 | 65.43 | 57.17 | 110.46 | 3080 | 7 |
| 109.016693 | 32.69 | 65.26 | 30.67 | 90.57 | 2849 | 5 |
| 109.068764 | 37.88 | 64.45 | 32.61 | 90.85 | 6052 | 5 |
| 109.139580 | 36.66 | 66.87 | 33.47 | 91.54 | 6063 | 9 |
| 109.210426 | 35.90 | 54.90 | 26.13 | 80.42 | 6057 | 9 |
| 109.281235 | 32.94 | 42.72 | 23.16 | 67.48 | 6058 | 4 |
| 109.352074 | 29.67 | 45.98 | 32.67 | 72.79 | 6060 | 4 |
| 109.422920 | 29.12 | 38.87 | 20.30 | 60.08 | 6058 | 2 |
| 109.493752 | 31.54 | 41.49 | 24.99 | 66.54 | 6050 | 2 |
| 109.564583 | 37.07 | 46.07 | 25.11 | 72.67 | 6055 | 3 |
| 109.635406 | 38.04 | 51.03 | 25.74 | 76.27 | 6053 | 3 |
| 109.706253 | 40.33 | 54.98 | 27.62 | 81.84 | 6047 | 3 |
| 109.777107 | 39.79 | 59.37 | 45.00 | 95.48 | 6047 | 12 |
| 109.847961 | 33.67 | 68.37 | 41.03 | 98.82 | 6052 | 12 |
| 109.918770 | 36.61 | 62.61 | 44.60 | 97.85 | 6044 | 6 |
| 109.977104 | 37.17 | 68.61 | 54.08 | 108.51 | 3898 | 6 |
| 110.011467 | 35.76 | 59.96 | 28.67 | 84.43 | 1963 | 15 |
| 110.058319 | 33.80 | 71.87 | 45.27 | 102.79 | 6050 | 15 |
| 110.129181 | 37.04 | 110.56 | 83.87 | 160.29 | 6061 | 27 |
| 110.199989 | 35.23 | 81.10 | 44.27 | 109.18 | 6043 | 27 |
| 110.270813 | 32.37 | 57.08 | 21.41 | 77.22 | 6054 | 6 |
| 110.341675 | 29.99 | 49.41 | 24.67 | 73.08 | 6060 | 6 |
| 110.412491 | 30.72 | 42.89 | 28.57 | 68.72 | 6055 | 6 |
| 110.483353 | 33.33 | 54.46 | 50.82 | 94.78 | 6045 | 6 |
| 110.554199 | 37.76 | 59.50 | 65.78 | 114.26 | 6031 | 15 |
| 110.625000 | 35.84 | 68.17 | 55.88 | 110.48 | 6056 | 15 |
| 110.696358 | 37.58 | 63.96 | 33.53 | 91.49 | 5890 | 15 |
| 110.766693 | 37.70 | 62.07 | 48.77 | 101.41 | 6053 | 6 |
| 110.837532 | 33.25 | 65.00 | 36.89 | 92.90 | 6049 | 6 |
| 110.908394 | 36.26 | 61.88 | 34.19 | 89.15 | 6058 | 6 |
| 110.971909 | 39.28 | 64.62 | 41.74 | 99.52 | 4790 | 6 |
| 111.006622 | 26.36 | 45.09 | 44.76 | 75.99 | 1127 | 15 |
| 111.048615 | 34.85 | 71.19 | 51.55 | 104.58 | 6044 | 15 |
| 111.119423 | 39.34 | 68.98 | 57.68 | 110.25 | 6058 | 15 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 111.190277 | 36.32 | 66.08 | 63.72 | 113.03 | 6056 | 18 |
| 111.261101 | 31.93 | 55.02 | 50.65 | 92.99 | 6063 | 18 |
| 111.331947 | 27.13 | 50.88 | 66.14 | 99.87 | 6060 | 18 |
| 111.402779 | 27.56 | 44.39 | 57.40 | 86.66 | 6054 | 7 |
| 111.473602 | 30.03 | 51.15 | 65.63 | 99.95 | 6057 | 7 |
| 111.544441 | 32.58 | 47.95 | 59.13 | 94.16 | 6051 | 15 |
| 111.615265 | 33.01 | 60.33 | 54.00 | 99.96 | 6057 | 15 |
| 111.761757 | 34.90 | 83.20 | 63.24 | 124.65 | 5234 | 9 |
| 111.827805 | 31.28 | 51.92 | 55.37 | 92.96 | 6056 | 9 |
| 111.898636 | 33.02 | 42.16 | 56.38 | 89.18 | 6059 | 6 |
| 111.967033 | 37.98 | 48.61 | 54.86 | 93.47 | 5629 | 6 |
| 112.001747 | 46.15 | 79.74 | 18.23 | 94.28 | 293 | 12 |
| 112.038864 | 41.10 | 54.79 | 36.87 | 86.84 | 6049 | 12 |
| 112.109711 | 42.03 | 56.12 | 37.73 | 88.30 | 6054 | 12 |
| 112.180565 | 38.51 | 51.04 | 26.48 | 75.18 | 6063 | 5 |
| 112.251366 | 37.90 | 45.49 | 23.47 | 69.25 | 6055 | 3 |
| 112.322235 | 30.70 | 44.49 | 24.77 | 67.36 | 6060 | 3 |
| 112.393059 | 27.66 | 54.55 | 39.46 | 81.22 | 6059 | 22 |
| 112.463890 | 29.12 | 53.81 | 39.17 | 82.62 | 6055 | 22 |
| 112.534714 | 32.48 | 52.95 | 29.78 | 77.81 | 6047 | 12 |
| 112.605545 | 33.54 | 61.66 | 25.60 | 82.74 | 6057 | 12 |
| 112.676414 | 30.13 | 45.15 | 36.69 | 76.37 | 6049 | 12 |
| 112.747246 | 27.76 | 43.36 | 29.42 | 68.86 | 6048 | 12 |
| 112.818092 | 29.12 | 43.45 | 29.01 | 69.07 | 6056 | 6 |
| 112.888908 | 29.15 | 51.44 | 41.57 | 81.49 | 6060 | 5 |
| 112.959747 | 34.89 | 56.91 | 36.61 | 85.28 | 6054 | 5 |
| 112.997559 | 25.75 | 52.90 | 12.90 | 65.40 | 414 | 5 |
| 113.032303 | 36.96 | 54.12 | 52.49 | 95.40 | 5516 | 4 |
| 113.099998 | 38.74 | 58.08 | 49.83 | 96.40 | 6052 | 4 |
| 113.170845 | 37.71 | 55.96 | 45.24 | 90.56 | 6056 | 6 |
| 113.241669 | 36.69 | 54.07 | 47.08 | 89.00 | 6058 | 6 |
| 113.312500 | 30.74 | 61.34 | 60.55 | 104.30 | 6055 | 7 |
| 113.383347 | 28.33 | 43.46 | 56.77 | 85.96 | 6057 | 7 |
| 113.454170 | 28.01 | 51.36 | 54.29 | 89.36 | 6058 | 7 |
| 113.525002 | 30.14 | 51.33 | 58.53 | 92.61 | 6051 | 6 |
| 113.671989 | 31.16 | 50.55 | 48.79 | 85.98 | 5134 | 3 |
| 113.737511 | 28.03 | 47.57 | 57.75 | 91.25 | 6045 | 3 |
| 113.808357 | 28.39 | 48.20 | 61.94 | 95.29 | 6053 | 4 |
| 113.879204 | 28.40 | 57.83 | 62.83 | 102.08 | 6058 | 4 |
| 113.949997 | 32.28 | 56.56 | 54.35 | 96.15 | 6050 | 4 |
| 113.992706 | 31.98 | 63.74 | 87.74 | 119.39 | 1247 | 4 |
| 114.027489 | 35.07 | 53.97 | 31.83 | 82.36 | 4675 | 4 |
| 114.090279 | 36.39 | 57.18 | 30.84 | 82.93 | 6057 | 4 |
| 114.161110 | 35.96 | 52.17 | 30.28 | 78.94 | 6066 | 3 |
| 114.231918 | 34.61 | 47.62 | 22.23 | 69.31 | 6055 | 3 |
| 114.302780 | 29.37 | 52.05 | 25.84 | 73.65 | 6064 | 9 |
| 114.373627 | 26.56 | 67.11 | 49.38 | 98.25 | 6057 | 9 |
| 114.444435 | 26.23 | 44.71 | 35.99 | 71.85 | 6055 | 7 |
| 114.515282 | 28.33 | 44.40 | 32.69 | 70.75 | 6050 | 5 |
| 114.586075 | 33.13 | 48.86 | 27.65 | 73.65 | 6054 | 5 |
| 114.656944 | 28.88 | 55.86 | 40.26 | 83.96 | 6055 | 7 |
| 114.727837 | 29.05 | 44.89 | 44.89 | 80.51 | 6038 | 7 |
| 114.798637 | 28.71 | 46.88 | 33.24 | 71.79 | 6055 | 5 |
| 114.869492 | 28.12 | 51.07 | 29.61 | 74.37 | 6044 | 5 |
| 114.940315 | 31.28 | 50.92 | 33.30 | 78.27 | 6046 | 7 |
| 114.987846 | 44.20 | 61.28 | 40.91 | 97.51 | 2073 | 7 |
| 115.022614 | 27.06 | 52.02 | 17.27 | 68.34 | 3848 | 6 |
| 115.080528 | 35.24 | 59.11 | 29.57 | 83.66 | 6048 | 6 |
| 115.151398 | 34.27 | 55.76 | 24.59 | 77.79 | 6062 | 18 |
| 115.222221 | 34.60 | 67.24 | 51.67 | 103.16 | 6045 | 18 |
| 115.293068 | 29.44 | 81.37 | 55.11 | 116.46 | 6054 | 27 |
| 115.363899 | 25.34 | 67.63 | 38.78 | 90.76 | 6046 | 27 |
| 115.434677 | 27.26 | 68.37 | 49.83 | 100.40 | 6040 | 27 |
| 115.508163 | 35.36 | 73.02 | 85.05 | 134.82 | 5255 | 56 |
| 115.576363 | 38.36 | 86.35 | 66.86 | 136.04 | 6034 | 56 |
| 115.647232 | 35.69 | 67.22 | 31.96 | 94.85 | 6050 | 15 |
| 115.718086 | 37.20 | 53.77 | 36.03 | 86.73 | 6046 | 15 |
| 115.788910 | 38.39 | 49.12 | 31.09 | 82.00 | 6056 | 7 |
| 115.859741 | 34.75 | 56.03 | 31.67 | 84.78 | 6052 | 7 |
| 115.930588 | 37.83 | 61.58 | 40.40 | 93.08 | 6056 | 9 |
| 115.982986 | 42.99 | 67.19 | 44.83 | 102.30 | 2903 | 9 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 116.017731 | 33.08 | 69.02 | 44.39 | 99.11 | 3027 | 6 |
| 116.070831 | 38.14 | 65.51 | 50.01 | 101.64 | 6057 | 6 |
| 116.141632 | 36.64 | 55.79 | 42.52 | 90.17 | 6054 | 2 |
| 116.212479 | 37.06 | 46.64 | 40.67 | 83.17 | 6051 | 2 |
| 116.283348 | 35.17 | 40.61 | 43.31 | 80.76 | 6061 | 3 |
| 116.425034 | 28.86 | 39.57 | 48.27 | 79.48 | 6053 | 9 |
| 116.495834 | 32.04 | 47.39 | 56.12 | 89.57 | 6055 | 9 |
| 116.566658 | 36.90 | 51.65 | 50.14 | 92.00 | 6051 | 6 |
| 116.637497 | 35.93 | 54.44 | 50.07 | 93.64 | 6057 | 6 |
| 116.708366 | 39.97 | 51.79 | 53.27 | 96.29 | 6055 | 6 |
| 116.779190 | 38.12 | 63.62 | 53.38 | 102.82 | 6051 | 7 |
| 116.850060 | 33.29 | 59.13 | 52.43 | 98.36 | 6046 | 7 |
| 116.920868 | 35.82 | 61.77 | 52.21 | 100.56 | 6060 | 4 |
| 116.978111 | 38.64 | 54.25 | 52.09 | 97.13 | 3731 | 4 |
| 117.012848 | 35.87 | 73.75 | 17.88 | 85.71 | 2199 | 0 |
| 117.061089 | 35.06 | 66.29 | 37.00 | 92.99 | 6047 | 0 |
| 117.131943 | 35.62 | 63.53 | 28.67 | 87.24 | 6061 | 0 |
| 117.202766 | 36.01 | 54.32 | 24.70 | 79.36 | 6058 | 0 |
| 117.273598 | 32.91 | 45.78 | 22.29 | 70.01 | 6059 | 4 |
| 117.344444 | 29.03 | 44.24 | 21.81 | 66.48 | 6056 | 4 |
| 117.415276 | 28.06 | 43.44 | 23.61 | 64.95 | 6057 | 3 |
| 117.486115 | 33.38 | 48.78 | 31.97 | 76.94 | 6056 | 3 |
| 117.556931 | 37.29 | 48.51 | 25.04 | 75.51 | 6055 | 3 |
| 117.627769 | 37.14 | 53.15 | 25.89 | 77.79 | 6052 | 0 |
| 117.698624 | 37.56 | 62.83 | 25.96 | 85.95 | 6047 | 0 |
| 117.769455 | 36.04 | 53.42 | 36.71 | 86.94 | 6058 | 3 |
| 117.840286 | 32.95 | 60.49 | 32.26 | 86.78 | 6050 | 3 |
| 117.911133 | 34.80 | 61.06 | 33.55 | 88.71 | 6054 | 3 |
| 117.973251 | 37.89 | 74.00 | 44.18 | 106.35 | 4559 | 3 |
| 118.007988 | 22.11 | 32.31 | 12.23 | 43.20 | 1364 | 15 |
| 118.051376 | 30.84 | 73.48 | 37.48 | 98.94 | 6048 | 15 |
| 118.122223 | 33.67 | 72.71 | 29.24 | 95.44 | 6061 | 15 |
| 118.193077 | 33.75 | 57.45 | 24.99 | 80.89 | 6058 | 6 |
| 118.263878 | 29.86 | 50.50 | 20.58 | 72.21 | 6061 | 7 |
| 118.334724 | 28.71 | 50.70 | 24.35 | 73.11 | 6063 | 7 |
| 118.405563 | 29.73 | 63.50 | 47.38 | 96.61 | 6048 | 12 |
| 118.476379 | 32.31 | 73.34 | 53.19 | 111.77 | 6053 | 12 |
| 118.547386 | 36.33 | 71.33 | 51.78 | 111.65 | 5992 | 9 |
| 118.618057 | 38.58 | 66.22 | 55.69 | 112.80 | 6046 | 9 |
| 118.688911 | 40.22 | 81.07 | 37.44 | 110.19 | 6044 | 15 |
| 118.759720 | 42.20 | 62.38 | 30.62 | 92.68 | 6042 | 12 |
| 118.830605 | 29.48 | 62.98 | 29.71 | 84.37 | 6051 | 12 |
| 118.901421 | 31.79 | 54.30 | 40.67 | 85.13 | 6046 | 27 |
| 118.968407 | 37.08 | 67.24 | 60.28 | 110.36 | 5385 | 27 |
| 119.003136 | 45.37 | 83.21 | 49.79 | 110.60 | 534 | 39 |
| 119.041664 | 41.37 | 78.03 | 78.82 | 137.38 | 6034 | 39 |
| 119.112511 | 39.35 | 66.79 | 59.84 | 111.59 | 6057 | 39 |
| 119.183342 | 36.95 | 93.55 | 66.76 | 136.37 | 6052 | 18 |
| 119.254158 | 33.53 | 71.43 | 52.10 | 106.01 | 6057 | 15 |
| 119.324997 | 28.70 | 57.06 | 52.93 | 94.30 | 6063 | 15 |
| 119.395836 | 27.91 | 70.00 | 69.05 | 117.69 | 6056 | 9 |
| 119.466667 | 28.20 | 55.18 | 55.44 | 93.54 | 6056 | 9 |
| 119.537491 | 30.83 | 53.32 | 50.38 | 88.24 | 6049 | 7 |
| 119.684212 | 31.40 | 56.73 | 52.74 | 98.31 | 5189 | 7 |
| 119.750015 | 31.27 | 56.95 | 59.50 | 101.42 | 6050 | 9 |
| 119.820869 | 30.67 | 53.00 | 53.37 | 94.10 | 6045 | 9 |
| 119.891678 | 32.46 | 55.63 | 62.46 | 103.65 | 6051 | 9 |
| 119.962509 | 36.85 | 58.81 | 52.60 | 100.23 | 6048 | 9 |
| 119.998955 | 18.52 | 97.93 | 31.93 | 107.57 | 176 | 9 |
| 120.033356 | 38.62 | 56.74 | 39.25 | 89.04 | 5696 | 12 |
| 120.102081 | 40.90 | 65.92 | 54.83 | 106.14 | 6055 | 12 |
| 120.172905 | 35.34 | 73.82 | 45.81 | 103.14 | 6051 | 12 |
| 120.243752 | 33.94 | 49.98 | 25.01 | 72.19 | 6049 | 12 |
| 120.314598 | 27.83 | 53.88 | 27.90 | 74.81 | 6057 | 6 |
| 120.385437 | 25.97 | 43.68 | 24.37 | 63.10 | 6058 | 9 |
| 120.532890 | 28.11 | 51.64 | 43.56 | 80.82 | 5058 | 15 |
| 120.597908 | 30.87 | 59.21 | 34.78 | 83.89 | 6054 | 15 |
| 120.668762 | 27.86 | 48.78 | 29.68 | 71.67 | 6044 | 12 |
| 120.739609 | 31.48 | 53.63 | 48.10 | 90.49 | 6049 | 12 |
| 120.810448 | 30.88 | 56.02 | 46.08 | 89.64 | 6054 | 12 |
| 120.881287 | 29.92 | 52.43 | 43.30 | 84.27 | 6053 | 22 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 120.952103 | 35.01 | 64.36 | 44.45 | 97.27 | 6053 | 22 |
| 120.993752 | 27.52 | 67.55 | 36.52 | 91.95 | 1066 | 22 |
| 121.028496 | 37.72 | 65.32 | 42.96 | 98.03 | 4859 | 15 |
| 121.092384 | 37.43 | 71.90 | 57.48 | 113.15 | 6045 | 15 |
| 121.163208 | 37.14 | 74.49 | 52.66 | 109.92 | 6058 | 32 |
| 121.234032 | 33.98 | 66.75 | 28.44 | 87.99 | 6055 | 32 |
| 121.304863 | 30.16 | 51.42 | 24.38 | 73.28 | 6059 | 5 |
| 121.375710 | 26.58 | 43.47 | 26.02 | 63.95 | 6059 | 4 |
| 121.446541 | 25.73 | 40.67 | 20.33 | 58.76 | 6061 | 4 |
| 121.517349 | 28.78 | 46.40 | 27.83 | 68.76 | 6048 | 7 |
| 121.588196 | 31.72 | 55.11 | 27.95 | 77.65 | 6059 | 7 |
| 121.659042 | 31.02 | 62.38 | 44.84 | 94.91 | 6051 | 9 |
| 121.729881 | 32.30 | 54.58 | 47.58 | 89.99 | 6045 | 9 |
| 121.800728 | 32.96 | 60.14 | 44.79 | 94.45 | 6049 | 15 |
| 121.871559 | 30.84 | 57.08 | 43.77 | 87.81 | 6053 | 15 |
| 121.942421 | 34.00 | 52.09 | 32.21 | 80.23 | 6056 | 6 |
| 121.988899 | 53.29 | 49.72 | 52.81 | 103.94 | 1894 | 6 |
| 122.023643 | 27.56 | 54.13 | 24.80 | 73.54 | 4031 | 6 |
| 122.082642 | 37.28 | 62.53 | 37.49 | 90.94 | 6056 | 6 |
| 122.153519 | 39.08 | 75.15 | 64.15 | 121.38 | 6051 | 22 |
| 122.224297 | 31.94 | 75.05 | 35.68 | 98.91 | 6053 | 22 |
| 122.295158 | 29.02 | 66.69 | 37.33 | 90.93 | 6054 | 12 |
| 122.365929 | 24.37 | 52.43 | 32.32 | 74.14 | 6049 | 12 |
| 122.436333 | 24.46 | 46.30 | 19.40 | 62.10 | 4735 | 15 |
| 122.508438 | 33.03 | 61.56 | 46.00 | 92.37 | 4878 | 15 |
| 122.578423 | 31.53 | 63.33 | 30.99 | 84.95 | 6053 | 15 |
| 122.649284 | 29.14 | 69.93 | 37.03 | 92.60 | 6056 | 18 |
| 122.720123 | 31.68 | 71.70 | 43.02 | 101.08 | 6043 | 18 |
| 122.790993 | 32.17 | 62.77 | 60.79 | 107.28 | 6053 | 18 |
| 122.861816 | 37.01 | 60.73 | 60.81 | 104.86 | 6045 | 18 |
| 122.932663 | 41.99 | 68.86 | 47.93 | 106.33 | 6059 | 15 |
| 122.984032 | 45.45 | 86.13 | 62.55 | 129.75 | 2723 | 15 |
| 123.018761 | 35.43 | 70.48 | 57.10 | 108.31 | 3198 | 18 |
| 123.072891 | 48.65 | 77.71 | 61.54 | 125.17 | 6051 | 18 |
| 123.143753 | 45.77 | 62.10 | 48.82 | 103.30 | 6055 | 7 |
| 123.285393 | 37.57 | 73.65 | 61.93 | 116.14 | 6056 | 7 |
| 123.356247 | 27.67 | 61.01 | 65.37 | 106.31 | 6054 | 7 |
| 123.427086 | 30.77 | 66.00 | 76.78 | 121.24 | 6057 | 32 |
| 123.497894 | 34.18 | 80.39 | 65.84 | 123.36 | 6060 | 32 |
| 123.568703 | 30.35 | 72.98 | 66.37 | 116.21 | 6049 | 39 |
| 123.639572 | 27.50 | 83.58 | 65.15 | 122.81 | 6052 | 22 |
| 123.710426 | 28.94 | 65.17 | 79.71 | 120.03 | 6054 | 22 |
| 123.781273 | 32.88 | 59.43 | 78.46 | 117.34 | 6050 | 18 |
| 123.852119 | 35.10 | 60.72 | 73.49 | 115.33 | 6044 | 18 |
| 123.922951 | 41.18 | 68.92 | 69.75 | 123.34 | 6056 | 22 |
| 123.979134 | 42.83 | 57.39 | 72.09 | 117.65 | 3552 | 22 |
| 124.013885 | 46.87 | 64.19 | 24.58 | 88.95 | 2372 | 9 |
| 124.063187 | 41.39 | 67.53 | 34.94 | 96.08 | 6053 | 9 |
| 124.134018 | 40.61 | 72.68 | 32.85 | 98.25 | 6063 | 9 |
| 124.204842 | 38.52 | 74.75 | 41.97 | 102.54 | 6050 | 9 |
| 124.275703 | 37.13 | 75.10 | 37.77 | 99.45 | 6061 | 12 |
| 124.346527 | 28.47 | 49.78 | 23.92 | 67.95 | 6060 | 12 |
| 124.417351 | 25.24 | 41.83 | 31.25 | 65.32 | 6059 | 5 |
| 124.488152 | 29.97 | 46.72 | 28.10 | 70.53 | 6045 | 5 |
| 124.559006 | 32.32 | 50.32 | 25.46 | 72.55 | 6055 | 7 |
| 124.629829 | 31.60 | 56.11 | 33.61 | 82.35 | 6051 | 27 |
| 124.700722 | 29.47 | 55.20 | 41.84 | 86.63 | 6054 | 27 |
| 124.771530 | 34.17 | 61.35 | 62.68 | 110.40 | 6048 | 48 |
| 124.842377 | 34.34 | 60.50 | 61.34 | 109.79 | 6053 | 48 |
| 124.913216 | 40.16 | 62.69 | 51.74 | 104.75 | 6055 | 22 |
| 124.974304 | 46.32 | 65.51 | 50.33 | 107.50 | 4382 | 22 |
| 125.009041 | 32.21 | 45.95 | 28.05 | 71.08 | 1544 | 5 |
| 125.053459 | 40.10 | 65.65 | 37.72 | 94.53 | 6050 | 5 |
| 125.124283 | 41.25 | 59.90 | 32.16 | 88.46 | 6061 | 5 |
| 125.195137 | 39.24 | 48.51 | 25.46 | 74.29 | 6063 | 5 |
| 125.265945 | 37.82 | 51.98 | 28.28 | 76.94 | 6061 | 6 |
| 125.336830 | 30.64 | 46.97 | 25.64 | 69.22 | 6053 | 6 |
| 125.407639 | 27.75 | 47.56 | 28.19 | 70.18 | 6053 | 9 |
| 125.478462 | 29.29 | 55.68 | 40.49 | 85.45 | 6056 | 9 |
| 125.549278 | 30.97 | 64.27 | 41.51 | 91.68 | 6053 | 6 |
| 125.620140 | 31.12 | 64.11 | 42.68 | 92.76 | 6047 | 6 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 125.690971 | 29.48 | 50.81 | 28.54 | 74.53 | 6052 | 6 |
| 125.761818 | 27.09 | 48.05 | 32.74 | 73.45 | 6054 | 7 |
| 125.832664 | 29.97 | 48.30 | 38.23 | 77.65 | 6055 | 7 |
| 125.903481 | 37.47 | 51.34 | 58.31 | 96.38 | 6053 | 7 |
| 125.969467 | 41.18 | 56.49 | 55.21 | 99.56 | 5215 | 7 |
| 126.004181 | 52.59 | 62.38 | 18.44 | 85.10 | 711 | 7 |
| 126.043762 | 42.27 | 55.40 | 32.76 | 85.80 | 6051 | 7 |
| 126.114571 | 46.51 | 64.33 | 37.29 | 96.31 | 6051 | 7 |
| 126.185417 | 40.89 | 70.03 | 42.54 | 101.91 | 6058 | 7 |
| 126.256226 | 42.35 | 80.05 | 53.64 | 118.23 | 6054 | 18 |
| 126.327072 | 31.66 | 54.38 | 33.06 | 80.11 | 6054 | 18 |
| 126.397903 | 30.14 | 53.99 | 37.97 | 80.01 | 6051 | 7 |
| 126.468727 | 31.71 | 60.45 | 55.67 | 96.92 | 6048 | 7 |
| 126.539528 | 32.45 | 58.36 | 56.08 | 98.69 | 6044 | 12 |
| 126.610397 | 30.32 | 64.98 | 44.84 | 95.14 | 6050 | 12 |
| 126.681236 | 30.71 | 51.70 | 27.29 | 74.76 | 6044 | 5 |
| 126.752083 | 27.37 | 49.03 | 33.34 | 73.12 | 6051 | 7 |
| 126.822937 | 29.66 | 51.49 | 32.13 | 76.82 | 6054 | 7 |
| 126.893753 | 34.68 | 43.11 | 40.11 | 77.13 | 6054 | 15 |
| 126.964592 | 41.69 | 47.70 | 37.45 | 82.08 | 6049 | 15 |
| 127.034737 | 48.98 | 62.76 | 66.87 | 117.17 | 5932 | 18 |
| 127.104836 | 48.49 | 80.96 | 65.64 | 131.77 | 6050 | 18 |
| 127.175682 | 38.71 | 103.04 | 65.36 | 142.53 | 6055 | 18 |
| 127.246513 | 39.75 | 74.47 | 38.35 | 100.97 | 6060 | 18 |
| 127.317352 | 34.21 | 58.93 | 32.48 | 83.78 | 6059 | 6 |
| 127.388191 | 30.95 | 47.88 | 35.36 | 75.25 | 6048 | 6 |
| 127.459015 | 30.90 | 51.45 | 31.43 | 76.15 | 6062 | 6 |
| 127.529846 | 32.12 | 57.70 | 42.20 | 86.52 | 6053 | 9 |
| 127.600685 | 32.02 | 62.14 | 42.09 | 90.65 | 6057 | 9 |
| 127.671516 | 29.27 | 51.70 | 26.83 | 73.72 | 6051 | 7 |
| 127.742371 | 26.71 | 43.84 | 34.04 | 70.05 | 6043 | 7 |
| 127.813210 | 27.92 | 44.97 | 38.77 | 75.44 | 6051 | 6 |
| 127.884048 | 31.29 | 47.63 | 44.23 | 82.41 | 6056 | 15 |
| 127.954865 | 38.53 | 50.67 | 49.71 | 90.55 | 6055 | 15 |
| 127.995125 | 24.34 | 39.47 | 48.89 | 75.85 | 831 | 15 |
| 128.029526 | 45.11 | 72.39 | 61.04 | 117.81 | 5039 | 7 |
| 128.094452 | 41.98 | 71.05 | 50.90 | 110.71 | 6050 | 7 |
| 128.165253 | 39.12 | 70.67 | 47.70 | 106.35 | 6053 | 7 |
| 128.236099 | 36.02 | 72.63 | 32.92 | 96.04 | 6053 | 7 |
| 128.306946 | 32.24 | 54.84 | 28.46 | 77.23 | 6060 | 6 |
| 128.377762 | 27.30 | 41.16 | 26.11 | 62.73 | 6059 | 4 |
| 128.448608 | 27.06 | 44.63 | 24.93 | 64.99 | 6059 | 4 |
| 128.519440 | 31.64 | 47.55 | 28.38 | 71.59 | 6055 | 4 |
| 128.590271 | 31.51 | 49.69 | 25.91 | 71.93 | 6050 | 4 |
| 128.661118 | 29.17 | 63.38 | 31.65 | 85.41 | 6041 | 2 |
| 128.731995 | 25.48 | 45.99 | 40.52 | 74.76 | 6023 | 2 |
| 128.802795 | 24.52 | 46.55 | 42.70 | 77.81 | 6052 | 6 |
| 128.876083 | 23.80 | 46.38 | 31.75 | 69.41 | 5454 | 4 |
| 128.944473 | 32.71 | 53.76 | 35.09 | 82.01 | 6053 | 4 |
| 128.989929 | 46.97 | 54.06 | 52.79 | 98.63 | 1722 | 4 |
| 129.024689 | 31.19 | 49.95 | 24.63 | 72.77 | 4209 | 3 |
| 129.084702 | 36.52 | 55.25 | 33.06 | 83.47 | 6053 | 3 |
| 129.155563 | 36.04 | 59.33 | 32.46 | 84.66 | 6061 | 0 |
| 129.226395 | 34.09 | 48.29 | 24.41 | 70.79 | 6059 | 0 |
| 129.297226 | 28.98 | 49.05 | 27.24 | 70.62 | 6063 | 3 |
| 129.368027 | 24.26 | 47.22 | 24.73 | 65.02 | 6055 | 3 |
| 129.438873 | 24.46 | 47.41 | 23.89 | 64.47 | 6056 | 3 |
| 129.509705 | 27.47 | 48.75 | 26.04 | 68.23 | 6059 | 4 |
| 129.580536 | 28.79 | 50.73 | 28.15 | 72.46 | 6053 | 4 |
| 129.651398 | 27.82 | 59.81 | 29.96 | 80.00 | 6052 | 4 |
| 129.722244 | 25.53 | 45.71 | 33.04 | 70.26 | 6044 | 4 |
| 129.793076 | 25.25 | 45.55 | 36.72 | 72.00 | 6045 | 6 |
| 129.863922 | 25.34 | 48.22 | 33.12 | 72.37 | 6057 | 6 |
| 129.934738 | 30.82 | 51.42 | 35.41 | 79.05 | 6054 | 7 |
| 129.985077 | 38.92 | 52.10 | 59.22 | 97.66 | 2551 | 7 |
| 130.019821 | 28.00 | 53.23 | 16.60 | 69.71 | 3371 | 5 |
| 130.074982 | 34.16 | 59.09 | 38.15 | 87.67 | 6046 | 5 |
| 130.145828 | 32.97 | 59.20 | 44.48 | 91.76 | 6061 | 9 |
| 130.216660 | 31.14 | 70.02 | 34.43 | 92.77 | 6057 | 9 |
| 130.287506 | 27.99 | 57.57 | 27.06 | 76.99 | 6060 | 4 |
| 130.358337 | 22.36 | 62.09 | 35.17 | 84.01 | 6061 | 4 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 130.429153 | 23.11 | 49.78 | 38.35 | 75.80 | 6057 | 6 |
| 130.499969 | 26.22 | 58.56 | 39.50 | 82.75 | 6049 | 6 |
| 130.570831 | 27.60 | 53.91 | 38.38 | 82.29 | 6046 | 6 |
| 130.641647 | 27.88 | 54.06 | 35.52 | 79.32 | 6047 | 12 |
| 130.712509 | 30.02 | 56.12 | 49.03 | 91.19 | 6047 | 12 |
| 130.783340 | 29.07 | 62.46 | 52.82 | 98.93 | 6054 | 12 |
| 130.854187 | 24.59 | 59.27 | 47.11 | 88.80 | 6052 | 12 |
| 130.925018 | 30.94 | 57.99 | 48.06 | 92.05 | 6060 | 9 |
| 130.980194 | 32.89 | 67.02 | 47.89 | 100.40 | 3375 | 9 |
| 131.014938 | 35.99 | 67.70 | 43.80 | 99.31 | 2553 | 12 |
| 131.065262 | 34.45 | 79.77 | 46.73 | 109.06 | 6053 | 12 |
| 131.136108 | 34.81 | 82.03 | 55.65 | 120.03 | 6062 | 9 |
| 131.206955 | 31.67 | 65.77 | 31.15 | 87.13 | 6056 | 9 |
| 131.277771 | 31.07 | 61.03 | 29.00 | 82.81 | 6061 | 4 |
| 131.348618 | 24.06 | 52.08 | 29.58 | 71.57 | 6057 | 4 |
| 131.419449 | 23.31 | 50.61 | 36.22 | 75.58 | 6054 | 3 |
| 131.490265 | 25.42 | 53.03 | 39.96 | 80.52 | 6055 | 3 |
| 131.561081 | 29.34 | 55.74 | 34.07 | 80.58 | 6050 | 5 |
| 131.631927 | 28.60 | 53.44 | 36.15 | 80.27 | 6050 | 4 |
| 131.702789 | 30.23 | 52.64 | 34.07 | 79.58 | 6053 | 4 |
| 131.773621 | 31.41 | 47.50 | 35.25 | 77.33 | 6052 | 4 |
| 131.844467 | 29.05 | 48.08 | 37.11 | 77.99 | 6053 | 4 |
| 131.915283 | 30.10 | 57.87 | 37.80 | 84.81 | 6045 | 5 |
| 131.975327 | 35.38 | 71.13 | 46.60 | 101.27 | 4205 | 5 |
| 132.010086 | 26.78 | 35.50 | 43.10 | 70.28 | 1723 | 5 |
| 132.055557 | 32.07 | 71.54 | 53.14 | 106.55 | 6053 | 5 |
| 132.126373 | 32.62 | 76.55 | 54.78 | 113.64 | 6058 | 5 |
| 132.197250 | 30.78 | 66.03 | 46.36 | 96.69 | 6050 | 5 |
| 132.268051 | 29.50 | 68.28 | 54.45 | 106.47 | 6063 | 5 |
| 132.338882 | 22.89 | 51.78 | 47.47 | 83.59 | 6060 | 5 |
| 132.409714 | 21.48 | 46.41 | 54.72 | 83.19 | 6057 | 2 |
| 132.557068 | 27.52 | 53.59 | 45.09 | 85.14 | 5075 | 5 |
| 132.622208 | 29.75 | 56.65 | 52.36 | 94.07 | 6048 | 5 |
| 132.693085 | 29.86 | 50.33 | 54.15 | 89.90 | 6052 | 2 |
| 132.763885 | 29.90 | 51.41 | 55.32 | 92.59 | 6049 | 3 |
| 132.834717 | 28.21 | 50.99 | 51.24 | 88.26 | 6043 | 3 |
| 132.905563 | 30.14 | 50.20 | 58.53 | 96.24 | 6055 | 7 |
| 132.970474 | 33.91 | 56.40 | 55.56 | 98.63 | 5037 | 7 |
| 133.005203 | 45.91 | 33.85 | 12.79 | 62.30 | 891 | 7 |
| 133.045837 | 34.32 | 60.25 | 38.79 | 88.60 | 6049 | 7 |
| 133.116653 | 36.81 | 73.03 | 48.32 | 107.95 | 6057 | 7 |
| 133.187500 | 34.29 | 83.68 | 73.99 | 130.43 | 6059 | 18 |
| 133.258301 | 38.34 | 78.33 | 61.70 | 119.11 | 6056 | 27 |
| 133.329163 | 31.01 | 83.04 | 60.35 | 119.74 | 6055 | 27 |
| 133.400040 | 27.94 | 81.52 | 81.20 | 132.75 | 6042 | 15 |
| 133.470795 | 26.69 | 54.75 | 55.77 | 92.80 | 6051 | 15 |
| 133.541626 | 28.11 | 58.84 | 53.00 | 94.35 | 6052 | 7 |
| 133.612488 | 29.23 | 56.04 | 38.81 | 83.90 | 6047 | 7 |
| 133.683334 | 26.69 | 48.89 | 35.21 | 75.35 | 6048 | 4 |
| 133.754181 | 26.22 | 43.61 | 30.02 | 66.39 | 6046 | 12 |
| 133.825073 | 26.17 | 61.38 | 54.29 | 97.39 | 6047 | 12 |
| 133.895874 | 28.32 | 56.75 | 62.23 | 100.43 | 6053 | 27 |
| 133.965591 | 32.09 | 66.70 | 57.02 | 106.35 | 5862 | 27 |
| 134.000366 | 35.93 | 95.91 | 27.09 | 106.00 | 57 | 27 |
| 134.036102 | 36.43 | 77.24 | 79.35 | 132.19 | 6045 | 27 |
| 134.120514 | 37.71 | 68.98 | 39.22 | 98.75 | 3545 | 27 |
| 134.177795 | 34.37 | 54.88 | 32.52 | 79.84 | 6063 | 7 |
| 134.248718 | 36.25 | 52.17 | 21.60 | 73.23 | 6039 | 7 |
| 134.319427 | 30.69 | 45.68 | 21.02 | 65.22 | 6060 | 7 |
| 134.390289 | 27.21 | 43.54 | 33.41 | 69.50 | 6056 | 9 |
| 134.461105 | 27.01 | 46.39 | 25.72 | 67.01 | 6055 | 9 |
| 134.531967 | 29.94 | 48.82 | 35.02 | 75.48 | 6046 | 18 |
| 134.602783 | 33.32 | 55.88 | 29.67 | 79.51 | 6047 | 18 |
| 134.673630 | 35.21 | 73.81 | 33.12 | 100.01 | 6049 | 22 |
| 134.744461 | 25.68 | 47.85 | 69.22 | 102.72 | 6049 | 22 |
| 134.816147 | 24.37 | 60.22 | 47.88 | 91.83 | 5831 | 15 |
| 134.886154 | 24.51 | 57.89 | 46.58 | 87.59 | 6049 | 7 |
| 134.956970 | 30.23 | 53.88 | 37.30 | 82.13 | 6057 | 7 |
| 134.996185 | 18.94 | 40.49 | 14.34 | 51.82 | 650 | 7 |
| 135.030914 | 34.48 | 59.99 | 33.72 | 85.79 | 5280 | 22 |
| 135.097214 | 41.15 | 67.45 | 53.79 | 106.65 | 6050 | 22 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|----|
| 135.168060 | 31.90 | 64.45 | 30.71 | 86.55 | 6060 | 9 |
| 135.238846 | 32.63 | 45.23 | 24.66 | 67.27 | 6053 | 9 |
| 135.309708 | 27.17 | 43.48 | 22.43 | 63.41 | 6057 | 5 |
| 135.380569 | 24.39 | 50.74 | 35.03 | 74.98 | 6060 | 5 |
| 135.451401 | 24.34 | 62.06 | 44.17 | 90.32 | 6049 | 5 |
| 135.522217 | 26.28 | 64.36 | 48.73 | 95.03 | 6049 | 6 |
| 135.593048 | 27.09 | 57.81 | 41.61 | 85.83 | 6055 | 6 |
| 135.663895 | 26.11 | 56.81 | 41.43 | 83.96 | 6052 | 5 |
| 135.734726 | 24.15 | 44.65 | 41.80 | 76.71 | 6046 | 5 |
| 135.805573 | 28.07 | 51.67 | 48.85 | 86.70 | 6056 | 12 |
| 135.876419 | 30.34 | 50.65 | 57.96 | 94.47 | 6054 | 6 |
| 135.947250 | 43.24 | 49.90 | 83.62 | 118.24 | 6059 | 6 |
| 135.991302 | 47.28 | 65.20 | 142.85 | 178.96 | 1484 | 6 |
| 136.026077 | 55.56 | 66.94 | 86.85 | 137.64 | 4446 | 32 |
| 136.087494 | 59.17 | 88.38 | 110.62 | 175.17 | 6052 | 32 |
| 136.158325 | 48.33 | 82.47 | 99.39 | 152.49 | 6057 | 12 |
| 136.229172 | 45.11 | 66.53 | 93.40 | 138.18 | 6053 | 12 |
| 136.300003 | 44.60 | 69.56 | 93.19 | 140.51 | 6062 | 9 |
| 136.370499 | 39.96 | 83.05 | 99.09 | 151.95 | 6002 | 9 |
| 136.444183 | 47.97 | 89.07 | 109.86 | 168.59 | 4876 | 12 |
| 136.512497 | 56.99 | 103.55 | 110.62 | 179.00 | 6055 | 7 |
| 136.583328 | 55.71 | 85.52 | 118.99 | 172.17 | 6054 | 7 |
| 136.654175 | 60.43 | 97.37 | 131.82 | 191.09 | 6046 | 9 |
| 136.725006 | 53.55 | 76.21 | 131.62 | 171.97 | 6051 | 9 |
| 136.795837 | 33.42 | 60.45 | 67.22 | 107.91 | 6057 | 6 |
| 136.866684 | 29.68 | 51.50 | 68.40 | 100.40 | 6055 | 6 |
| 136.937515 | 34.91 | 61.71 | 62.58 | 103.67 | 6056 | 9 |
| 136.986435 | 37.67 | 52.01 | 74.94 | 111.17 | 2314 | 9 |
| 137.020874 | 40.39 | 57.23 | 48.92 | 94.64 | 3556 | 12 |
| 137.077072 | 41.02 | 73.00 | 48.09 | 112.48 | 6052 | 12 |
| 137.147903 | 39.58 | 114.87 | 76.26 | 162.23 | 6061 | 32 |
| 137.218735 | 38.05 | 85.22 | 40.29 | 115.48 | 6055 | 32 |
| 137.289566 | 37.76 | 56.92 | 25.98 | 84.42 | 6058 | 15 |
| 137.360428 | 31.03 | 70.67 | 60.19 | 110.00 | 6054 | 15 |
| 137.431259 | 31.15 | 64.50 | 63.41 | 108.02 | 6052 | 15 |
| 137.501953 | 32.99 | 64.02 | 53.71 | 100.85 | 6031 | 12 |
| 137.573090 | 36.03 | 65.99 | 42.23 | 97.11 | 6013 | 12 |
| 137.643738 | 29.56 | 52.84 | 35.09 | 78.52 | 6056 | 12 |
| 137.718307 | 21.41 | 43.51 | 23.47 | 61.00 | 4946 | 12 |
| 137.786819 | 24.00 | 54.79 | 41.93 | 83.51 | 5686 | 15 |
| 137.856247 | 25.12 | 62.17 | 52.25 | 96.19 | 6048 | 15 |
| 137.927124 | 30.36 | 63.63 | 53.73 | 99.86 | 6055 | 15 |
| 137.981232 | 33.30 | 62.10 | 69.73 | 110.42 | 3196 | 15 |
| 138.015991 | 34.14 | 63.72 | 37.68 | 91.26 | 2731 | 80 |
| 138.067368 | 47.06 | 105.55 | 93.50 | 169.76 | 6048 | 80 |
| 138.138199 | 54.75 | 129.44 | 100.48 | 195.69 | 6052 | 80 |
| 138.209045 | 48.20 | 107.38 | 80.94 | 159.35 | 6045 | 80 |
| 138.279846 | 44.58 | 72.76 | 35.94 | 100.88 | 6059 | 18 |
| 138.350708 | 34.43 | 47.97 | 32.10 | 76.77 | 6050 | 18 |
| 138.421509 | 30.95 | 45.63 | 25.86 | 69.47 | 6057 | 9 |
| 138.492355 | 34.16 | 47.14 | 39.68 | 80.35 | 6053 | 9 |
| 138.563156 | 35.25 | 62.20 | 24.66 | 84.05 | 6051 | 6 |
| 138.634018 | 35.04 | 55.19 | 27.75 | 79.58 | 6051 | 4 |
| 138.704880 | 35.40 | 54.46 | 30.36 | 82.00 | 6052 | 4 |
| 138.775711 | 32.49 | 51.39 | 32.83 | 80.76 | 6054 | 12 |
| 138.846558 | 33.17 | 65.62 | 50.85 | 101.36 | 6053 | 12 |
| 138.917404 | 32.88 | 68.74 | 45.34 | 99.16 | 6056 | 15 |
| 138.976379 | 36.23 | 81.68 | 65.28 | 122.79 | 4023 | 15 |
| 139.011124 | 35.37 | 54.57 | 22.84 | 77.98 | 1903 | 18 |
| 139.057648 | 35.87 | 72.66 | 43.80 | 102.46 | 6051 | 18 |
| 139.128510 | 39.02 | 81.64 | 40.02 | 110.74 | 6055 | 9 |
| 139.199310 | 38.33 | 53.67 | 26.63 | 77.81 | 6061 | 9 |
| 139.270126 | 37.83 | 61.77 | 32.41 | 87.23 | 6063 | 6 |
| 139.340988 | 30.35 | 55.55 | 36.96 | 84.16 | 6049 | 6 |
| 139.411789 | 27.57 | 49.79 | 38.81 | 78.39 | 6053 | 6 |
| 139.482635 | 29.70 | 39.68 | 34.08 | 67.77 | 6053 | 6 |
| 139.553467 | 32.30 | 42.97 | 25.16 | 67.54 | 6056 | 4 |
| 139.624313 | 32.59 | 56.06 | 22.55 | 74.96 | 6050 | 4 |
| 139.695145 | 28.58 | 61.81 | 33.12 | 83.93 | 6044 | 3 |
| 139.765991 | 29.24 | 51.63 | 33.69 | 77.17 | 6055 | 3 |
| 139.841660 | 22.74 | 42.32 | 19.30 | 56.86 | 4739 | 3 |

| | | | | | | |
|------------|-------|-------|--------|--------|------|----|
| 139.907669 | 32.14 | 55.89 | 44.79 | 89.01 | 6046 | 5 |
| 139.971558 | 38.19 | 63.36 | 48.59 | 102.79 | 4848 | 5 |
| 140.006256 | 44.89 | 38.11 | 13.59 | 63.26 | 1070 | 7 |
| 140.047913 | 40.60 | 63.02 | 57.21 | 108.57 | 6047 | 7 |
| 140.118744 | 42.89 | 58.37 | 48.53 | 99.71 | 6053 | 7 |
| 140.189606 | 41.82 | 50.59 | 35.22 | 82.91 | 6051 | 7 |
| 140.260406 | 40.19 | 46.14 | 21.89 | 70.44 | 6062 | 7 |
| 140.331268 | 33.89 | 45.14 | 21.74 | 67.46 | 6048 | 7 |
| 140.402115 | 31.65 | 56.64 | 45.70 | 90.30 | 6044 | 9 |
| 140.472900 | 30.62 | 46.97 | 29.64 | 72.28 | 6056 | 9 |
| 140.539597 | 28.60 | 51.96 | 34.76 | 77.47 | 5345 | 9 |
| 140.620041 | 32.87 | 62.02 | 30.11 | 83.89 | 5114 | 9 |
| 140.685440 | 31.32 | 48.04 | 26.38 | 71.55 | 6055 | 6 |
| 140.756256 | 27.20 | 44.82 | 32.69 | 70.83 | 6047 | 5 |
| 140.827118 | 28.67 | 42.71 | 30.58 | 68.14 | 6051 | 5 |
| 140.897934 | 32.94 | 44.91 | 36.36 | 75.39 | 6059 | 5 |
| 140.966721 | 41.42 | 45.56 | 32.52 | 78.98 | 5693 | 5 |
| 141.001404 | 50.13 | 81.38 | 25.04 | 99.06 | 235 | 4 |
| 141.038177 | 41.03 | 56.13 | 35.81 | 86.92 | 6044 | 4 |
| 141.109024 | 45.51 | 54.46 | 40.91 | 90.98 | 6053 | 4 |
| 141.179871 | 44.24 | 52.39 | 50.10 | 93.70 | 6060 | 3 |
| 141.250687 | 45.29 | 58.66 | 43.04 | 94.54 | 6061 | 4 |
| 141.321533 | 39.71 | 48.73 | 37.84 | 80.61 | 6058 | 4 |
| 141.392365 | 34.33 | 44.26 | 30.07 | 71.21 | 6058 | 3 |
| 141.463196 | 30.20 | 53.53 | 34.35 | 80.36 | 6055 | 3 |
| 141.534027 | 30.46 | 61.19 | 38.52 | 87.77 | 6045 | 4 |
| 141.604843 | 31.38 | 54.08 | 37.47 | 82.09 | 6057 | 4 |
| 141.675705 | 26.74 | 44.97 | 43.67 | 80.00 | 6048 | 4 |
| 141.746567 | 22.60 | 43.42 | 40.21 | 72.86 | 6050 | 4 |
| 141.817383 | 25.31 | 56.38 | 42.94 | 85.26 | 6050 | 9 |
| 141.888229 | 27.10 | 61.65 | 43.85 | 89.45 | 6053 | 5 |
| 141.959061 | 33.60 | 55.73 | 42.90 | 86.77 | 6051 | 5 |
| 141.997208 | 18.56 | 46.92 | 13.70 | 56.74 | 473 | 5 |
| 142.031952 | 38.87 | 78.80 | 58.78 | 118.72 | 5455 | 6 |
| 142.099289 | 37.78 | 62.06 | 44.67 | 97.07 | 6056 | 6 |
| 142.170120 | 35.11 | 54.82 | 31.37 | 80.64 | 6059 | 7 |
| 142.240982 | 35.41 | 66.62 | 44.58 | 96.32 | 6052 | 7 |
| 142.311798 | 32.26 | 48.38 | 20.52 | 68.13 | 6055 | 6 |
| 142.382645 | 27.19 | 48.52 | 27.65 | 70.36 | 6059 | 4 |
| 142.453461 | 25.10 | 42.48 | 19.30 | 59.42 | 6056 | 4 |
| 142.524307 | 30.28 | 45.30 | 27.98 | 69.12 | 6053 | 4 |
| 142.595123 | 30.59 | 48.28 | 22.53 | 68.29 | 6057 | 4 |
| 142.666000 | 26.46 | 50.61 | 32.72 | 74.24 | 6049 | 5 |
| 142.736816 | 25.90 | 51.91 | 32.31 | 74.23 | 6047 | 5 |
| 142.807663 | 24.32 | 50.24 | 46.04 | 82.48 | 6057 | 4 |
| 142.878494 | 26.56 | 53.33 | 55.64 | 93.36 | 6058 | 7 |
| 142.949341 | 29.89 | 62.35 | 49.99 | 97.44 | 6057 | 7 |
| 142.992355 | 25.61 | 60.12 | 66.87 | 103.99 | 1307 | 7 |
| 143.027115 | 35.16 | 54.51 | 38.53 | 86.94 | 4627 | 5 |
| 143.089569 | 34.27 | 59.62 | 46.67 | 94.82 | 6053 | 5 |
| 143.160431 | 31.37 | 54.39 | 49.47 | 90.21 | 6062 | 9 |
| 143.231232 | 30.67 | 56.45 | 61.45 | 99.42 | 6052 | 9 |
| 143.302078 | 26.74 | 49.14 | 82.78 | 111.15 | 6057 | 7 |
| 143.372910 | 21.95 | 55.02 | 87.05 | 117.19 | 6056 | 7 |
| 143.443741 | 24.34 | 66.91 | 103.49 | 139.05 | 6052 | 12 |
| 143.514572 | 26.47 | 57.63 | 99.22 | 129.73 | 6042 | 7 |
| 143.585388 | 33.72 | 54.61 | 105.00 | 133.62 | 6053 | 7 |
| 143.656250 | 33.64 | 45.79 | 83.44 | 110.11 | 6050 | 5 |
| 143.802216 | 36.52 | 66.85 | 76.08 | 121.24 | 5317 | 9 |
| 143.868759 | 29.71 | 56.13 | 72.31 | 105.76 | 6055 | 9 |
| 143.939606 | 32.76 | 54.03 | 74.10 | 107.86 | 6054 | 7 |
| 143.987488 | 35.45 | 63.97 | 74.10 | 115.84 | 2137 | 7 |
| 144.022263 | 35.41 | 55.82 | 54.72 | 94.29 | 3793 | 6 |
| 144.079865 | 38.58 | 58.09 | 48.89 | 95.58 | 6057 | 6 |
| 144.150711 | 34.15 | 60.60 | 51.85 | 96.84 | 6063 | 9 |
| 144.221527 | 33.18 | 55.28 | 55.57 | 94.61 | 6060 | 9 |
| 144.292343 | 34.00 | 48.69 | 58.25 | 91.91 | 6060 | 9 |
| 144.363190 | 26.78 | 54.72 | 75.33 | 105.52 | 6056 | 9 |
| 144.434036 | 27.12 | 49.46 | 68.45 | 98.21 | 6059 | 6 |
| 144.504868 | 30.85 | 50.60 | 54.09 | 88.71 | 6053 | 7 |
| 144.575699 | 36.08 | 53.06 | 63.04 | 99.38 | 6050 | 7 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|-----|
| 144.646530 | 32.51 | 49.91 | 55.62 | 90.48 | 6049 | 18 |
| 144.792511 | 31.74 | 71.85 | 91.91 | 132.78 | 5318 | 111 |
| 144.859100 | 28.27 | 74.84 | 78.56 | 123.15 | 6038 | 111 |
| 144.929901 | 33.58 | 75.36 | 87.17 | 135.38 | 6039 | 67 |
| 144.982620 | 38.69 | 103.09 | 100.32 | 166.99 | 2940 | 67 |
| 145.017059 | 48.87 | 125.88 | 109.76 | 191.93 | 2897 | 207 |
| 145.069427 | 42.32 | 123.81 | 106.01 | 188.18 | 6040 | 207 |
| 145.140213 | 52.41 | 224.76 | 223.00 | 352.29 | 5998 | 179 |
| 145.211166 | 50.82 | 142.26 | 83.99 | 187.79 | 6037 | 179 |
| 145.281937 | 47.92 | 104.09 | 82.11 | 158.37 | 6056 | 80 |
| 145.352783 | 40.54 | 168.66 | 114.82 | 227.11 | 6039 | 80 |
| 145.423630 | 40.93 | 103.30 | 102.80 | 168.75 | 6050 | 67 |
| 145.494431 | 38.32 | 88.93 | 89.45 | 148.34 | 6052 | 67 |
| 145.565262 | 43.67 | 74.24 | 63.87 | 123.30 | 6057 | 48 |
| 145.636093 | 46.78 | 63.29 | 36.88 | 100.67 | 6053 | 48 |
| 145.706970 | 48.97 | 75.33 | 50.27 | 119.92 | 6050 | 48 |
| 145.777786 | 53.55 | 88.91 | 68.00 | 144.56 | 6045 | 80 |
| 145.848633 | 43.21 | 69.94 | 52.71 | 115.71 | 6051 | 80 |
| 145.919495 | 43.18 | 77.72 | 46.07 | 111.44 | 6057 | 32 |
| 145.977417 | 41.39 | 76.69 | 32.96 | 103.98 | 3844 | 32 |
| 146.012161 | 57.53 | 116.05 | 63.89 | 158.09 | 2079 | 39 |
| 146.059723 | 47.55 | 95.64 | 71.63 | 147.89 | 6049 | 39 |
| 146.125595 | 46.27 | 103.47 | 69.51 | 154.81 | 5203 | 39 |
| 146.201416 | 39.49 | 98.45 | 53.48 | 133.61 | 6044 | 39 |
| 146.272217 | 36.84 | 100.97 | 59.16 | 138.35 | 6061 | 27 |
| 146.343063 | 34.90 | 91.40 | 76.17 | 137.58 | 6060 | 27 |
| 146.413864 | 32.96 | 80.19 | 57.55 | 117.42 | 6051 | 27 |
| 146.484711 | 36.04 | 67.96 | 49.99 | 103.30 | 6052 | 27 |
| 146.555542 | 37.70 | 73.52 | 49.55 | 110.99 | 6052 | 15 |
| 146.626358 | 40.12 | 63.05 | 49.23 | 105.70 | 6044 | 22 |
| 146.697250 | 43.08 | 68.31 | 58.26 | 114.05 | 6053 | 22 |
| 146.768097 | 42.74 | 58.65 | 54.33 | 104.12 | 6053 | 27 |
| 146.838928 | 41.52 | 61.68 | 48.25 | 102.76 | 6052 | 27 |
| 146.909760 | 39.99 | 68.40 | 45.19 | 102.76 | 6054 | 27 |
| 146.972580 | 51.88 | 73.20 | 74.81 | 134.81 | 4680 | 27 |
| 147.007309 | 39.01 | 65.78 | 8.82 | 78.80 | 1248 | 15 |
| 147.050003 | 44.22 | 85.26 | 50.74 | 121.94 | 6051 | 15 |
| 147.120819 | 42.29 | 90.00 | 56.56 | 128.78 | 6060 | 15 |
| 147.191696 | 36.67 | 92.71 | 52.68 | 125.47 | 6057 | 18 |
| 147.260590 | 35.97 | 62.08 | 36.72 | 90.07 | 5674 | 18 |
| 147.333328 | 34.08 | 76.15 | 56.22 | 113.12 | 6058 | 18 |
| 147.404160 | 34.56 | 70.75 | 69.81 | 118.11 | 6053 | 18 |
| 147.474976 | 34.64 | 59.61 | 47.10 | 95.05 | 6054 | 18 |
| 147.545807 | 36.25 | 55.89 | 46.87 | 91.73 | 6051 | 9 |
| 147.616638 | 38.85 | 58.43 | 43.63 | 95.14 | 6057 | 9 |
| 147.687500 | 41.55 | 54.34 | 38.52 | 90.89 | 6053 | 22 |
| 147.758331 | 36.90 | 51.26 | 38.16 | 85.18 | 6044 | 18 |
| 147.829163 | 36.47 | 44.92 | 24.00 | 71.60 | 6050 | 18 |
| 147.899994 | 37.83 | 47.36 | 24.15 | 74.10 | 6057 | 2 |
| 147.967697 | 41.45 | 48.24 | 35.63 | 82.84 | 5512 | 2 |
| 148.002426 | 64.27 | 72.97 | 26.43 | 102.24 | 413 | 7 |
| 148.040253 | 45.11 | 56.10 | 30.19 | 88.03 | 6049 | 7 |
| 148.111084 | 45.22 | 58.50 | 25.57 | 88.81 | 6050 | 7 |
| 148.181946 | 39.61 | 64.20 | 28.78 | 90.15 | 6056 | 6 |
| 148.252762 | 41.75 | 57.81 | 31.14 | 88.43 | 6057 | 5 |
| 148.323593 | 34.71 | 61.28 | 29.96 | 87.45 | 6062 | 5 |
| 148.394440 | 29.81 | 64.00 | 46.34 | 96.60 | 6053 | 6 |
| 148.465271 | 31.33 | 51.30 | 43.13 | 84.86 | 6058 | 6 |
| 148.536102 | 34.45 | 52.01 | 35.18 | 81.05 | 6043 | 9 |
| 148.606903 | 36.78 | 54.00 | 37.57 | 87.56 | 6047 | 9 |
| 148.677780 | 39.24 | 55.82 | 37.71 | 89.55 | 6046 | 12 |
| 148.748627 | 35.43 | 48.09 | 42.11 | 84.59 | 6050 | 12 |
| 148.819473 | 35.71 | 52.06 | 31.28 | 80.55 | 6050 | 9 |
| 148.890289 | 40.08 | 63.16 | 44.12 | 97.78 | 6058 | 12 |
| 148.961105 | 44.30 | 59.92 | 34.21 | 90.86 | 6048 | 12 |
| 148.998245 | 24.11 | 89.96 | 24.77 | 97.20 | 296 | 12 |
| 149.033005 | 43.47 | 54.77 | 32.41 | 89.58 | 5631 | 5 |
| 149.101379 | 44.96 | 62.91 | 31.95 | 96.14 | 6049 | 5 |
| 149.172241 | 38.92 | 53.80 | 33.69 | 85.32 | 6061 | 6 |
| 149.243027 | 39.96 | 67.95 | 44.29 | 103.64 | 6056 | 6 |
| 149.313873 | 34.07 | 56.86 | 32.35 | 84.42 | 6061 | 7 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 149.384720 | 30.40 | 45.09 | 32.33 | 72.13 | 6060 | 9 |
| 149.455551 | 30.12 | 45.52 | 43.01 | 78.91 | 6061 | 9 |
| 149.526367 | 33.84 | 53.07 | 53.70 | 95.06 | 6048 | 9 |
| 149.597198 | 33.78 | 53.28 | 36.30 | 82.98 | 6053 | 9 |
| 149.668045 | 35.71 | 58.21 | 30.29 | 85.80 | 6049 | 12 |
| 149.738892 | 33.80 | 50.46 | 42.22 | 84.72 | 6048 | 12 |
| 149.809723 | 36.36 | 56.53 | 37.99 | 89.30 | 6051 | 12 |
| 149.880569 | 37.18 | 66.92 | 50.70 | 104.93 | 6048 | 12 |
| 149.951401 | 43.59 | 63.07 | 53.99 | 105.13 | 6057 | 12 |
| 149.993393 | 37.85 | 68.49 | 34.57 | 94.22 | 1128 | 12 |
| 150.028152 | 44.26 | 70.23 | 43.43 | 104.49 | 4805 | 7 |
| 150.091644 | 43.07 | 68.89 | 34.22 | 97.56 | 6052 | 7 |
| 150.162506 | 37.60 | 60.20 | 47.89 | 100.84 | 6064 | 15 |
| 150.233307 | 36.09 | 78.53 | 57.64 | 116.78 | 6052 | 15 |
| 150.304153 | 35.14 | 65.03 | 51.96 | 105.82 | 6063 | 9 |
| 150.375000 | 28.91 | 55.44 | 38.54 | 83.14 | 6060 | 9 |
| 150.445816 | 27.61 | 52.39 | 32.19 | 76.32 | 6054 | 9 |
| 150.516663 | 33.28 | 47.16 | 28.45 | 73.89 | 6050 | 22 |
| 150.587479 | 35.76 | 56.97 | 26.80 | 83.83 | 6053 | 22 |
| 150.658325 | 31.87 | 66.55 | 52.86 | 103.27 | 6047 | 39 |
| 150.729218 | 33.81 | 68.97 | 63.46 | 117.50 | 6033 | 39 |
| 150.800034 | 31.77 | 56.49 | 51.41 | 98.83 | 6048 | 48 |
| 150.870895 | 37.71 | 72.59 | 50.81 | 109.75 | 6048 | 48 |
| 150.941681 | 39.94 | 71.96 | 59.13 | 118.62 | 6059 | 39 |
| 150.988510 | 54.45 | 102.47 | 57.69 | 144.23 | 1948 | 39 |
| 151.023300 | 36.57 | 70.95 | 70.81 | 120.36 | 3971 | 32 |
| 151.081955 | 45.58 | 108.36 | 78.92 | 166.09 | 6047 | 32 |
| 151.152771 | 38.01 | 69.08 | 63.72 | 114.76 | 6063 | 12 |
| 151.223587 | 40.95 | 76.47 | 70.95 | 125.75 | 6052 | 12 |
| 151.294464 | 40.10 | 81.41 | 76.14 | 130.52 | 6054 | 32 |
| 151.365265 | 31.00 | 58.63 | 62.24 | 101.85 | 6062 | 32 |
| 151.436111 | 28.21 | 59.46 | 74.23 | 110.55 | 6060 | 18 |
| 151.506927 | 31.75 | 70.59 | 73.15 | 119.56 | 6059 | 22 |
| 151.577805 | 27.24 | 63.27 | 71.81 | 117.31 | 6042 | 22 |
| 151.648605 | 27.78 | 65.02 | 69.64 | 112.80 | 6049 | 22 |
| 151.794724 | 32.18 | 51.36 | 59.88 | 96.76 | 5291 | 15 |
| 151.861130 | 32.09 | 68.72 | 57.16 | 105.80 | 6054 | 15 |
| 151.931976 | 36.84 | 72.72 | 60.07 | 116.24 | 6052 | 22 |
| 151.983658 | 40.93 | 74.51 | 62.01 | 116.97 | 2785 | 22 |
| 152.018097 | 33.18 | 57.69 | 34.55 | 85.42 | 3082 | 12 |
| 152.071533 | 37.22 | 72.86 | 40.90 | 101.39 | 6054 | 12 |
| 152.142349 | 37.70 | 78.97 | 56.71 | 118.55 | 6059 | 27 |
| 152.213211 | 31.83 | 70.21 | 41.24 | 96.96 | 6053 | 27 |
| 152.284012 | 30.57 | 58.86 | 30.44 | 80.18 | 6063 | 9 |
| 152.354874 | 26.04 | 47.41 | 27.55 | 68.07 | 6060 | 9 |
| 152.425690 | 23.34 | 38.07 | 28.02 | 60.84 | 6052 | 4 |
| 152.496521 | 26.50 | 43.00 | 26.98 | 63.87 | 6055 | 4 |
| 152.567322 | 33.26 | 49.11 | 27.73 | 72.15 | 6052 | 4 |
| 152.638168 | 30.68 | 47.94 | 26.50 | 69.83 | 6058 | 4 |
| 152.709015 | 29.57 | 53.91 | 29.54 | 78.04 | 6048 | 4 |
| 152.779877 | 28.16 | 45.48 | 35.19 | 72.56 | 6053 | 6 |
| 152.850708 | 29.21 | 49.98 | 35.25 | 77.07 | 6048 | 6 |
| 152.921555 | 31.96 | 51.94 | 34.36 | 80.73 | 6049 | 12 |
| 152.978455 | 34.97 | 71.66 | 45.74 | 100.75 | 3672 | 12 |
| 153.013214 | 41.59 | 60.39 | 38.89 | 91.53 | 2257 | 15 |
| 153.061798 | 37.21 | 68.55 | 40.96 | 98.18 | 6050 | 15 |
| 153.132645 | 36.48 | 85.88 | 45.41 | 114.96 | 6059 | 15 |
| 153.203476 | 28.19 | 86.29 | 53.80 | 118.74 | 6061 | 15 |
| 153.274277 | 31.37 | 73.69 | 37.23 | 97.81 | 6059 | 12 |
| 153.345123 | 25.10 | 44.30 | 32.87 | 68.61 | 6056 | 12 |
| 153.415955 | 23.96 | 38.28 | 21.46 | 56.06 | 6059 | 3 |
| 153.486801 | 26.93 | 42.76 | 24.26 | 62.58 | 6053 | 3 |
| 153.557617 | 29.00 | 47.26 | 31.84 | 71.06 | 6051 | 6 |
| 153.628403 | 29.87 | 57.70 | 34.20 | 81.00 | 6048 | 4 |
| 153.699356 | 29.25 | 50.68 | 27.88 | 72.83 | 6042 | 4 |
| 153.770157 | 27.28 | 48.02 | 33.04 | 72.60 | 6045 | 3 |
| 153.840988 | 28.87 | 45.67 | 28.29 | 68.21 | 6052 | 3 |
| 153.911835 | 32.45 | 48.05 | 34.74 | 75.59 | 6060 | 9 |
| 153.973602 | 40.42 | 57.64 | 42.64 | 93.45 | 4503 | 9 |
| 154.008331 | 33.92 | 31.36 | 52.29 | 79.07 | 1424 | 6 |
| 154.052078 | 38.49 | 66.48 | 46.89 | 101.80 | 6053 | 6 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|----|
| 154.122864 | 41.25 | 61.31 | 47.26 | 98.92 | 6054 | 6 |
| 154.193756 | 35.48 | 61.39 | 50.62 | 99.09 | 6054 | 7 |
| 154.264572 | 35.46 | 53.38 | 51.23 | 92.41 | 6062 | 9 |
| 154.335419 | 27.71 | 43.64 | 56.73 | 84.39 | 6053 | 9 |
| 154.406250 | 25.51 | 40.16 | 48.47 | 76.08 | 6059 | 4 |
| 154.553604 | 28.65 | 63.19 | 58.91 | 102.21 | 5078 | 4 |
| 154.618729 | 29.50 | 54.17 | 55.23 | 93.96 | 6054 | 4 |
| 154.693802 | 23.01 | 37.87 | 53.51 | 79.68 | 4761 | 4 |
| 154.760437 | 25.34 | 44.08 | 53.83 | 85.58 | 6050 | 7 |
| 154.831284 | 27.03 | 47.31 | 51.84 | 87.15 | 6054 | 7 |
| 154.902115 | 31.49 | 49.72 | 58.13 | 97.17 | 6057 | 7 |
| 154.968796 | 36.08 | 52.18 | 53.53 | 96.76 | 5330 | 7 |
| 155.003479 | 50.44 | 51.70 | 36.89 | 84.36 | 592 | 12 |
| 155.042358 | 38.03 | 65.96 | 54.15 | 104.93 | 6053 | 12 |
| 155.113235 | 41.75 | 98.07 | 70.71 | 147.19 | 6041 | 12 |
| 155.193176 | 30.60 | 72.27 | 48.24 | 100.73 | 4381 | 7 |
| 155.254837 | 33.81 | 52.78 | 52.94 | 90.44 | 6056 | 9 |
| 155.325684 | 28.72 | 49.41 | 49.15 | 83.97 | 6062 | 9 |
| 155.396545 | 25.09 | 59.09 | 64.45 | 102.18 | 6053 | 18 |
| 155.467346 | 32.40 | 76.14 | 83.94 | 131.25 | 6050 | 18 |
| 155.538193 | 26.82 | 69.57 | 64.25 | 111.19 | 6051 | 15 |
| 155.685028 | 30.74 | 58.09 | 59.04 | 100.65 | 5172 | 6 |
| 155.750717 | 27.93 | 47.57 | 58.27 | 91.27 | 6048 | 15 |
| 155.821548 | 30.14 | 55.57 | 55.89 | 98.07 | 6055 | 15 |
| 155.892380 | 31.41 | 54.43 | 60.86 | 101.52 | 6055 | 7 |
| 155.963211 | 39.19 | 53.81 | 53.91 | 98.70 | 6054 | 7 |
| 155.999313 | 18.57 | 85.41 | 18.34 | 89.84 | 119 | 7 |
| 156.034042 | 41.19 | 54.86 | 31.39 | 85.07 | 5809 | 4 |
| 156.103455 | 41.53 | 63.12 | 35.62 | 92.15 | 6055 | 4 |
| 156.174316 | 35.37 | 55.47 | 33.00 | 80.87 | 6060 | 6 |
| 156.245132 | 34.21 | 50.90 | 30.93 | 75.83 | 6059 | 6 |
| 156.315964 | 29.25 | 48.77 | 32.28 | 75.07 | 6062 | 12 |
| 156.386810 | 26.11 | 39.95 | 20.01 | 57.65 | 6061 | 2 |
| 156.457642 | 24.49 | 41.27 | 21.12 | 57.94 | 6060 | 2 |
| 156.528458 | 28.14 | 47.39 | 23.23 | 65.96 | 6040 | 3 |
| 156.599289 | 30.67 | 48.96 | 24.96 | 70.12 | 6054 | 3 |
| 156.670135 | 27.48 | 61.43 | 30.51 | 81.30 | 6053 | 15 |
| 156.741013 | 25.90 | 62.08 | 39.78 | 86.07 | 6045 | 15 |
| 156.811844 | 28.39 | 48.41 | 39.61 | 78.99 | 6046 | 32 |
| 156.882660 | 31.11 | 50.27 | 59.42 | 96.16 | 6049 | 22 |
| 156.953506 | 37.78 | 71.51 | 59.85 | 110.90 | 6052 | 22 |
| 156.994431 | 28.81 | 59.16 | 63.82 | 110.95 | 948 | 22 |
| 157.029175 | 45.11 | 91.06 | 69.96 | 141.20 | 4982 | 27 |
| 157.093796 | 39.10 | 83.92 | 64.40 | 128.60 | 6037 | 27 |
| 157.164612 | 33.51 | 93.09 | 62.34 | 127.60 | 6060 | 15 |
| 157.235428 | 31.29 | 100.69 | 66.40 | 138.45 | 6053 | 15 |
| 157.306274 | 25.29 | 80.53 | 48.33 | 107.38 | 6051 | 27 |
| 157.377106 | 26.25 | 59.62 | 58.47 | 96.92 | 6053 | 18 |
| 157.447922 | 28.51 | 72.05 | 64.00 | 113.05 | 6050 | 18 |
| 157.518723 | 34.59 | 75.26 | 107.57 | 155.39 | 6039 | 39 |
| 157.589554 | 28.61 | 65.74 | 39.51 | 90.16 | 6051 | 39 |
| 157.660400 | 27.61 | 58.31 | 34.82 | 82.79 | 6045 | 15 |
| 157.731277 | 25.66 | 56.35 | 36.23 | 80.17 | 6051 | 15 |
| 157.802109 | 28.27 | 54.15 | 37.47 | 80.72 | 6049 | 27 |
| 157.872955 | 29.23 | 51.22 | 41.33 | 81.63 | 6054 | 27 |
| 157.943817 | 30.65 | 61.07 | 41.23 | 91.93 | 6039 | 27 |
| 157.989548 | 42.65 | 119.97 | 87.45 | 169.02 | 1774 | 27 |
| 158.024368 | 31.49 | 57.77 | 39.10 | 88.98 | 4149 | 15 |
| 158.084045 | 34.68 | 74.30 | 40.74 | 103.68 | 6054 | 15 |
| 158.160355 | 34.23 | 67.60 | 40.04 | 94.00 | 5075 | 9 |
| 158.225677 | 30.81 | 57.35 | 25.66 | 76.06 | 6054 | 9 |
| 158.296509 | 28.30 | 51.21 | 23.21 | 70.33 | 6057 | 9 |
| 158.367371 | 21.21 | 50.91 | 36.22 | 74.11 | 6056 | 9 |
| 158.438202 | 23.84 | 56.21 | 45.90 | 88.92 | 6058 | 12 |
| 158.509018 | 24.44 | 64.00 | 49.90 | 94.94 | 6046 | 18 |
| 158.579865 | 27.70 | 54.77 | 36.46 | 81.14 | 6056 | 18 |
| 158.650681 | 23.39 | 57.88 | 36.16 | 81.69 | 6051 | 48 |
| 158.721558 | 26.03 | 56.03 | 35.04 | 81.13 | 6047 | 48 |
| 158.792389 | 29.49 | 58.52 | 35.34 | 83.60 | 6049 | 6 |
| 158.863235 | 27.23 | 49.57 | 34.63 | 75.92 | 6046 | 6 |
| 158.934052 | 29.61 | 53.64 | 37.43 | 82.80 | 6059 | 5 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|----|
| 158.984711 | 37.56 | 67.13 | 62.66 | 108.78 | 2607 | 5 |
| 159.019135 | 27.62 | 60.99 | 21.67 | 76.29 | 3260 | 6 |
| 159.073624 | 33.54 | 61.18 | 34.53 | 86.10 | 6051 | 6 |
| 159.144455 | 33.33 | 55.29 | 29.78 | 79.74 | 6057 | 5 |
| 159.215271 | 36.73 | 46.48 | 28.17 | 74.13 | 6056 | 5 |
| 159.286118 | 35.49 | 53.73 | 21.33 | 74.04 | 6060 | 9 |
| 159.356949 | 28.64 | 73.82 | 52.03 | 106.82 | 6053 | 9 |
| 159.427780 | 26.19 | 47.25 | 32.03 | 70.44 | 6059 | 12 |
| 159.498596 | 27.31 | 43.20 | 29.83 | 67.41 | 6054 | 12 |
| 159.569427 | 30.18 | 52.35 | 23.49 | 70.71 | 6057 | 12 |
| 159.640259 | 29.16 | 57.47 | 29.73 | 77.97 | 6055 | 12 |
| 159.711136 | 26.58 | 49.71 | 33.17 | 74.83 | 6055 | 12 |
| 159.781952 | 23.56 | 47.64 | 50.09 | 83.95 | 6044 | 12 |
| 159.852814 | 26.93 | 66.10 | 53.41 | 102.02 | 6044 | 12 |
| 159.923630 | 34.94 | 74.90 | 54.92 | 113.05 | 6053 | 22 |
| 159.979507 | 35.99 | 75.96 | 52.24 | 109.49 | 3492 | 22 |
| 160.014252 | 49.51 | 81.12 | 49.09 | 116.15 | 2438 | 12 |
| 160.063858 | 36.48 | 65.60 | 54.77 | 106.14 | 6047 | 12 |
| 160.134979 | 35.33 | 65.37 | 70.17 | 115.45 | 5937 | 22 |
| 160.205551 | 31.83 | 90.07 | 65.28 | 130.38 | 6060 | 22 |
| 160.276382 | 37.51 | 87.65 | 72.93 | 135.75 | 6054 | 32 |
| 160.347229 | 24.60 | 54.80 | 64.54 | 97.53 | 6056 | 32 |
| 160.418167 | 27.84 | 82.17 | 106.43 | 152.29 | 6007 | 94 |
| 160.488953 | 31.48 | 91.43 | 100.67 | 154.07 | 6027 | 94 |
| 160.636047 | 50.35 | 110.50 | 151.13 | 218.30 | 5106 | 94 |
| 160.701569 | 41.52 | 90.38 | 93.77 | 164.78 | 5988 | 94 |
| 160.772263 | 41.32 | 105.19 | 90.98 | 163.38 | 6045 | 80 |
| 160.843109 | 43.58 | 88.93 | 73.30 | 141.08 | 6050 | 80 |
| 160.913925 | 44.66 | 77.83 | 66.69 | 130.27 | 6057 | 48 |
| 160.974655 | 53.59 | 64.80 | 56.23 | 116.45 | 4327 | 48 |
| 161.009369 | 31.92 | 58.09 | 24.42 | 76.53 | 1606 | 3 |
| 161.054169 | 47.50 | 62.85 | 35.33 | 95.10 | 6054 | 3 |
| 161.125000 | 51.01 | 64.85 | 30.82 | 95.87 | 6064 | 5 |
| 161.195816 | 44.64 | 52.65 | 27.46 | 80.57 | 6059 | 5 |
| 161.266663 | 44.21 | 47.86 | 24.89 | 75.95 | 6062 | 5 |
| 161.337509 | 35.62 | 48.57 | 30.05 | 75.00 | 6047 | 5 |
| 161.408325 | 31.27 | 42.57 | 26.83 | 65.98 | 6054 | 9 |
| 161.479156 | 30.24 | 44.67 | 28.68 | 69.38 | 6053 | 9 |
| 161.550003 | 33.80 | 53.18 | 23.70 | 74.79 | 6051 | 5 |
| 161.620819 | 35.92 | 51.52 | 26.94 | 77.80 | 6057 | 5 |
| 161.691666 | 34.74 | 59.74 | 28.60 | 85.54 | 6048 | 4 |
| 161.762527 | 28.95 | 55.86 | 39.86 | 85.45 | 6046 | 2 |
| 161.833359 | 33.94 | 49.58 | 35.32 | 79.43 | 6052 | 2 |
| 161.904190 | 37.23 | 50.22 | 37.16 | 83.29 | 6055 | 9 |
| 161.969788 | 41.21 | 45.08 | 42.67 | 85.86 | 5157 | 9 |
| 162.004517 | 49.49 | 59.12 | 19.57 | 80.94 | 772 | 22 |
| 162.044449 | 44.76 | 69.11 | 70.57 | 123.38 | 6051 | 22 |
| 162.115280 | 49.25 | 75.12 | 71.32 | 131.78 | 6055 | 22 |
| 162.186127 | 39.00 | 63.65 | 54.16 | 104.96 | 6062 | 22 |
| 162.256927 | 38.00 | 79.11 | 69.24 | 127.03 | 6059 | 22 |
| 162.327759 | 34.85 | 94.89 | 69.82 | 138.43 | 6053 | 22 |
| 162.398605 | 34.83 | 86.81 | 62.56 | 125.38 | 6057 | 32 |
| 162.469421 | 28.61 | 63.13 | 61.15 | 104.43 | 6047 | 32 |
| 162.540268 | 35.41 | 64.18 | 63.66 | 108.87 | 6053 | 27 |
| 162.611115 | 32.04 | 61.49 | 65.74 | 111.56 | 6051 | 27 |
| 162.681961 | 37.24 | 64.45 | 54.98 | 110.94 | 6051 | 18 |
| 162.752808 | 29.02 | 64.03 | 49.07 | 100.78 | 6051 | 15 |
| 162.823639 | 33.71 | 65.91 | 42.76 | 96.82 | 6053 | 15 |
| 162.894470 | 35.39 | 54.44 | 50.28 | 93.51 | 6059 | 12 |
| 162.964935 | 41.86 | 66.18 | 52.53 | 106.52 | 5990 | 12 |
| 163.035065 | 41.28 | 70.45 | 103.23 | 147.10 | 5984 | 7 |
| 163.105545 | 45.04 | 67.20 | 103.40 | 147.79 | 6054 | 7 |
| 163.176392 | 44.44 | 61.02 | 101.68 | 140.75 | 6062 | 15 |
| 163.247223 | 41.33 | 48.77 | 93.57 | 123.62 | 6049 | 15 |
| 163.318039 | 37.57 | 57.20 | 92.03 | 127.76 | 6056 | 12 |
| 163.388931 | 30.40 | 96.89 | 127.94 | 181.49 | 6043 | 39 |
| 163.459747 | 30.27 | 70.73 | 126.51 | 162.97 | 6046 | 39 |
| 163.530563 | 35.40 | 72.72 | 150.95 | 187.32 | 6048 | 32 |
| 163.601395 | 33.22 | 74.71 | 134.96 | 174.70 | 6051 | 32 |
| 163.813919 | 29.97 | 70.57 | 95.38 | 136.28 | 6035 | 39 |
| 163.884750 | 32.64 | 53.22 | 110.57 | 138.10 | 6058 | 6 |

| | | | | | | |
|------------|-------|-------|--------|--------|------|----|
| 163.955551 | 41.38 | 50.92 | 98.11 | 129.84 | 6053 | 6 |
| 163.995468 | 24.87 | 46.50 | 133.32 | 151.71 | 770 | 6 |
| 164.030243 | 47.99 | 57.42 | 35.17 | 91.26 | 5154 | 12 |
| 164.095825 | 48.63 | 55.72 | 32.63 | 88.57 | 6057 | 12 |
| 164.166656 | 43.03 | 54.38 | 36.08 | 86.25 | 6059 | 12 |
| 164.237503 | 40.67 | 62.23 | 32.62 | 89.57 | 6059 | 12 |
| 164.308350 | 37.32 | 63.05 | 34.37 | 91.48 | 6054 | 18 |
| 164.379181 | 33.90 | 44.47 | 28.04 | 69.83 | 6060 | 5 |
| 164.449997 | 30.70 | 43.90 | 21.67 | 64.67 | 6062 | 5 |
| 164.520828 | 32.19 | 51.42 | 25.68 | 73.34 | 6049 | 22 |
| 164.591690 | 32.06 | 64.93 | 56.36 | 104.46 | 6051 | 22 |
| 164.662506 | 30.70 | 70.51 | 45.29 | 101.97 | 6052 | 22 |
| 164.733353 | 29.83 | 61.54 | 49.24 | 98.90 | 6050 | 22 |
| 164.804230 | 27.44 | 48.20 | 44.54 | 84.11 | 6042 | 15 |
| 164.875031 | 32.02 | 56.75 | 34.25 | 81.46 | 6056 | 15 |
| 164.945877 | 34.53 | 50.00 | 47.20 | 89.34 | 6047 | 15 |
| 164.990631 | 50.72 | 64.55 | 70.25 | 128.36 | 1604 | 15 |
| 165.025375 | 36.51 | 49.83 | 31.95 | 78.55 | 4324 | 6 |
| 165.086105 | 39.11 | 65.64 | 40.17 | 96.57 | 6054 | 6 |
| 165.156952 | 37.73 | 61.49 | 36.67 | 88.74 | 6063 | 9 |
| 165.227753 | 35.59 | 77.66 | 41.32 | 105.60 | 6050 | 9 |
| 165.298615 | 32.97 | 65.75 | 34.00 | 93.21 | 6058 | 9 |
| 165.369446 | 26.99 | 61.93 | 44.86 | 90.48 | 6041 | 9 |
| 165.440292 | 23.87 | 55.36 | 47.43 | 87.97 | 6055 | 12 |
| 165.511108 | 27.18 | 55.01 | 58.91 | 96.80 | 6052 | 18 |
| 165.581940 | 27.74 | 57.00 | 53.11 | 94.41 | 6058 | 18 |
| 165.652771 | 27.91 | 48.90 | 27.03 | 70.95 | 6056 | 7 |
| 165.723633 | 26.19 | 44.95 | 30.23 | 68.87 | 6052 | 7 |
| 165.794464 | 27.07 | 46.21 | 31.62 | 70.33 | 6039 | 6 |
| 165.865295 | 29.45 | 51.12 | 37.11 | 78.57 | 6048 | 6 |
| 165.936127 | 32.12 | 52.84 | 40.88 | 82.69 | 6054 | 12 |
| 165.985748 | 41.12 | 82.36 | 57.31 | 122.44 | 2431 | 12 |
| 166.020172 | 34.36 | 60.75 | 49.74 | 95.86 | 3440 | 22 |
| 166.075714 | 39.59 | 87.32 | 64.35 | 131.91 | 6048 | 22 |
| 166.146545 | 33.04 | 62.44 | 54.96 | 102.21 | 6056 | 7 |
| 166.217361 | 31.88 | 61.58 | 53.26 | 97.39 | 6059 | 7 |
| 166.288177 | 31.01 | 52.85 | 48.02 | 86.92 | 6051 | 27 |
| 166.359039 | 26.67 | 69.58 | 75.40 | 118.39 | 6061 | 27 |
| 166.429871 | 26.16 | 43.95 | 50.31 | 81.63 | 6054 | 9 |
| 166.577240 | 28.06 | 58.07 | 44.82 | 88.60 | 5073 | 32 |
| 166.642349 | 26.60 | 65.92 | 58.37 | 102.27 | 6052 | 39 |
| 166.713211 | 24.61 | 56.32 | 64.12 | 99.10 | 6049 | 39 |
| 166.784058 | 25.76 | 52.15 | 64.67 | 98.68 | 6050 | 56 |
| 166.854889 | 28.20 | 70.08 | 72.48 | 118.49 | 6048 | 56 |
| 166.925751 | 31.65 | 63.67 | 69.50 | 113.83 | 6050 | 39 |
| 166.980545 | 34.58 | 60.74 | 59.76 | 105.55 | 3317 | 39 |
| 167.015289 | 35.69 | 67.47 | 48.64 | 99.18 | 2608 | 67 |
| 167.065979 | 34.00 | 61.10 | 64.22 | 108.64 | 6052 | 67 |
| 167.136810 | 31.17 | 67.49 | 67.71 | 115.24 | 6063 | 12 |
| 167.207657 | 33.18 | 51.60 | 71.34 | 104.58 | 6051 | 12 |
| 167.278458 | 33.73 | 59.85 | 53.07 | 96.89 | 6059 | 12 |
| 167.349289 | 27.56 | 47.58 | 51.94 | 84.88 | 6054 | 12 |
| 167.420166 | 25.20 | 56.51 | 68.70 | 103.17 | 6044 | 12 |
| 167.490982 | 27.10 | 45.57 | 58.14 | 88.58 | 6054 | 12 |
| 167.561798 | 27.17 | 61.46 | 64.54 | 107.60 | 6052 | 22 |
| 167.632645 | 27.05 | 56.45 | 58.30 | 98.23 | 6042 | 22 |
| 167.779739 | 33.87 | 65.72 | 62.27 | 109.55 | 5129 | 32 |
| 167.845169 | 30.12 | 71.84 | 71.15 | 120.05 | 6052 | 32 |
| 167.916000 | 31.20 | 64.44 | 65.91 | 110.65 | 6051 | 7 |
| 167.975693 | 34.89 | 79.15 | 69.50 | 123.09 | 4148 | 7 |
| 168.010422 | 32.64 | 39.07 | 16.83 | 59.75 | 1784 | 9 |
| 168.056259 | 36.20 | 68.01 | 46.86 | 101.81 | 6053 | 9 |
| 168.127090 | 35.04 | 56.66 | 31.51 | 82.53 | 6055 | 4 |
| 168.197922 | 34.35 | 48.65 | 26.64 | 72.46 | 6055 | 4 |
| 168.268738 | 33.40 | 43.65 | 23.19 | 65.13 | 6055 | 4 |
| 168.339584 | 28.36 | 40.71 | 24.18 | 62.75 | 6058 | 4 |
| 168.410400 | 24.67 | 47.96 | 30.09 | 70.12 | 6054 | 4 |
| 168.481247 | 25.52 | 45.59 | 23.57 | 63.91 | 6055 | 4 |
| 168.552063 | 28.12 | 47.51 | 22.10 | 66.31 | 6051 | 4 |
| 168.622910 | 30.60 | 54.43 | 25.78 | 74.56 | 6053 | 4 |
| 168.693771 | 27.93 | 47.42 | 26.29 | 68.73 | 6050 | 3 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 168.764618 | 25.91 | 42.88 | 34.41 | 69.38 | 6048 | 3 |
| 168.835464 | 27.59 | 45.14 | 35.26 | 72.09 | 6053 | 3 |
| 168.906281 | 28.99 | 50.60 | 39.63 | 79.36 | 6057 | 6 |
| 168.970840 | 30.56 | 65.37 | 52.84 | 101.43 | 4977 | 6 |
| 169.005569 | 39.41 | 43.48 | 9.42 | 62.16 | 950 | 5 |
| 169.046539 | 33.86 | 59.45 | 44.47 | 92.32 | 6052 | 5 |
| 169.117355 | 35.38 | 55.76 | 29.36 | 80.54 | 6056 | 5 |
| 169.188187 | 33.39 | 48.65 | 28.83 | 72.84 | 6050 | 3 |
| 169.259033 | 32.69 | 43.41 | 23.82 | 65.00 | 6059 | 4 |
| 169.329819 | 27.43 | 40.93 | 20.80 | 60.73 | 6042 | 4 |
| 169.400803 | 26.38 | 44.18 | 25.99 | 65.92 | 5642 | 4 |
| 169.471512 | 31.26 | 50.17 | 28.28 | 73.54 | 6049 | 4 |
| 169.542343 | 31.81 | 53.54 | 35.35 | 80.78 | 6052 | 7 |
| 169.613190 | 30.20 | 52.52 | 29.90 | 76.88 | 6052 | 7 |
| 169.684021 | 29.72 | 48.53 | 41.47 | 82.53 | 6050 | 9 |
| 169.754898 | 24.75 | 59.83 | 27.51 | 78.12 | 6049 | 6 |
| 169.825699 | 30.45 | 41.94 | 39.34 | 76.13 | 6047 | 6 |
| 169.896545 | 32.26 | 44.91 | 44.53 | 80.15 | 6053 | 7 |
| 169.965988 | 43.22 | 51.48 | 34.79 | 85.00 | 5817 | 7 |
| 170.000702 | 55.75 | 69.67 | 20.56 | 91.67 | 116 | 5 |
| 170.036789 | 46.50 | 53.00 | 34.62 | 88.88 | 6052 | 5 |
| 170.107590 | 45.91 | 56.50 | 33.31 | 89.67 | 6052 | 5 |
| 170.178467 | 42.25 | 49.48 | 28.43 | 78.78 | 6062 | 2 |
| 170.249298 | 43.05 | 47.75 | 21.49 | 73.76 | 6057 | 2 |
| 170.320145 | 38.47 | 46.36 | 24.48 | 72.79 | 6057 | 3 |
| 170.390991 | 34.88 | 52.49 | 30.80 | 79.38 | 6054 | 6 |
| 170.461807 | 29.58 | 50.01 | 37.28 | 79.30 | 6054 | 6 |
| 170.532623 | 35.03 | 50.67 | 24.33 | 74.54 | 6054 | 7 |
| 170.603455 | 34.14 | 49.99 | 38.07 | 80.67 | 6057 | 7 |
| 170.674301 | 35.19 | 49.63 | 40.66 | 85.19 | 6053 | 18 |
| 170.745148 | 27.84 | 56.55 | 57.08 | 99.30 | 6049 | 18 |
| 170.815994 | 26.19 | 55.39 | 53.08 | 94.40 | 6053 | 27 |
| 170.886810 | 35.47 | 56.45 | 63.42 | 103.25 | 6057 | 15 |
| 170.957657 | 42.14 | 60.72 | 48.14 | 100.38 | 6053 | 15 |
| 170.996521 | 22.18 | 38.67 | 19.83 | 56.44 | 594 | 15 |
| 171.031281 | 47.86 | 56.52 | 47.19 | 100.31 | 5335 | 12 |
| 171.097900 | 45.04 | 64.67 | 56.29 | 109.67 | 6054 | 12 |
| 171.168732 | 41.67 | 47.77 | 31.99 | 79.24 | 6059 | 15 |
| 171.239563 | 43.62 | 45.06 | 20.53 | 70.85 | 6061 | 15 |
| 171.310410 | 39.69 | 43.27 | 22.71 | 69.74 | 6062 | 2 |
| 171.381241 | 34.08 | 40.71 | 22.71 | 65.11 | 6055 | 3 |
| 171.452087 | 30.15 | 45.13 | 21.29 | 65.87 | 6059 | 3 |
| 171.522903 | 33.77 | 50.94 | 24.22 | 74.21 | 6051 | 2 |
| 171.593719 | 34.29 | 61.88 | 33.12 | 87.18 | 6052 | 2 |
| 171.664566 | 31.41 | 72.52 | 32.81 | 96.17 | 6051 | 7 |
| 171.735428 | 23.73 | 49.99 | 40.26 | 77.88 | 6049 | 7 |
| 171.806274 | 26.48 | 43.80 | 41.61 | 76.99 | 6054 | 6 |
| 171.877121 | 27.71 | 43.61 | 39.45 | 75.06 | 6056 | 5 |
| 171.947922 | 34.35 | 52.61 | 35.52 | 80.84 | 6057 | 5 |
| 171.991669 | 24.79 | 81.70 | 85.17 | 128.50 | 1428 | 5 |
| 172.026077 | 37.95 | 55.58 | 44.89 | 94.10 | 4445 | 9 |
| 172.087463 | 35.55 | 63.12 | 58.21 | 107.79 | 6051 | 9 |
| 172.158340 | 33.42 | 55.19 | 31.95 | 81.22 | 6058 | 6 |
| 172.229126 | 32.96 | 49.53 | 25.31 | 71.36 | 6054 | 6 |
| 172.300018 | 32.20 | 51.82 | 25.13 | 74.10 | 6060 | 7 |
| 172.370834 | 27.12 | 67.27 | 43.14 | 94.51 | 6056 | 7 |
| 172.441681 | 25.20 | 59.39 | 47.93 | 90.16 | 6054 | 7 |
| 172.512482 | 27.12 | 50.00 | 49.61 | 84.95 | 6049 | 9 |
| 172.583328 | 26.93 | 56.26 | 33.43 | 80.28 | 6051 | 9 |
| 172.654144 | 27.61 | 46.46 | 27.05 | 68.47 | 6051 | 4 |
| 172.725006 | 24.59 | 42.49 | 37.65 | 71.09 | 6048 | 4 |
| 172.795837 | 25.19 | 43.86 | 33.93 | 69.08 | 6042 | 4 |
| 172.866714 | 26.77 | 44.23 | 36.67 | 72.87 | 6049 | 4 |
| 172.937531 | 31.73 | 47.71 | 31.52 | 74.24 | 6060 | 4 |
| 172.986450 | 35.60 | 55.55 | 57.16 | 94.98 | 2315 | 4 |
| 173.021225 | 33.57 | 49.75 | 15.39 | 69.10 | 3614 | 4 |
| 173.077774 | 36.36 | 55.03 | 36.85 | 86.79 | 6049 | 4 |
| 173.148605 | 33.67 | 54.02 | 30.94 | 80.48 | 6061 | 3 |
| 173.219421 | 33.60 | 48.60 | 20.79 | 68.99 | 6049 | 3 |
| 173.290283 | 32.15 | 45.76 | 32.25 | 73.28 | 6062 | 3 |
| 173.361115 | 25.47 | 42.08 | 28.04 | 64.67 | 6061 | 3 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 173.431961 | 24.92 | 45.74 | 27.03 | 66.72 | 6049 | 4 |
| 173.502777 | 26.56 | 51.77 | 34.31 | 76.22 | 6050 | 5 |
| 173.573685 | 28.64 | 53.96 | 29.07 | 73.69 | 6017 | 5 |
| 173.644424 | 26.43 | 45.07 | 30.58 | 69.00 | 6055 | 6 |
| 173.715317 | 22.64 | 48.11 | 33.22 | 72.08 | 6052 | 6 |
| 173.786118 | 21.57 | 47.59 | 41.11 | 76.49 | 6052 | 6 |
| 173.856979 | 22.23 | 59.31 | 49.06 | 90.17 | 6044 | 6 |
| 173.927795 | 27.37 | 71.63 | 60.76 | 110.85 | 6054 | 18 |
| 173.981613 | 31.23 | 75.30 | 65.70 | 118.46 | 3138 | 18 |
| 174.016327 | 32.07 | 67.85 | 63.98 | 110.41 | 2789 | 22 |
| 174.068039 | 33.21 | 70.51 | 58.24 | 109.41 | 6049 | 22 |
| 174.138870 | 30.35 | 58.51 | 48.62 | 91.32 | 6059 | 7 |
| 174.209717 | 31.09 | 56.08 | 44.90 | 86.66 | 6057 | 7 |
| 174.280563 | 29.49 | 60.77 | 53.13 | 95.35 | 6051 | 7 |
| 174.351395 | 23.74 | 53.93 | 54.91 | 89.47 | 6060 | 7 |
| 174.422226 | 22.05 | 49.04 | 56.53 | 86.16 | 6055 | 15 |
| 174.493042 | 24.07 | 48.10 | 49.92 | 81.40 | 6049 | 15 |
| 174.640121 | 26.53 | 61.29 | 50.37 | 93.80 | 5121 | 6 |
| 174.705597 | 25.10 | 57.02 | 58.82 | 96.35 | 6051 | 6 |
| 174.776428 | 24.55 | 52.75 | 61.14 | 96.75 | 6043 | 18 |
| 174.847290 | 24.64 | 55.15 | 54.98 | 93.58 | 6038 | 18 |
| 174.918076 | 29.74 | 51.41 | 56.08 | 96.35 | 6057 | 5 |
| 174.976730 | 35.00 | 68.64 | 56.41 | 109.13 | 3969 | 5 |
| 175.011459 | 39.79 | 31.28 | 16.87 | 61.11 | 1958 | 9 |
| 175.058319 | 34.66 | 62.66 | 41.47 | 92.61 | 6047 | 9 |
| 175.129150 | 33.33 | 76.41 | 40.44 | 106.34 | 6061 | 22 |
| 175.200012 | 30.99 | 76.20 | 51.17 | 109.63 | 6054 | 22 |
| 175.270844 | 28.69 | 65.69 | 39.05 | 92.13 | 6055 | 7 |
| 175.341660 | 23.18 | 41.53 | 21.26 | 58.58 | 6060 | 7 |
| 175.412506 | 21.98 | 38.21 | 21.36 | 55.54 | 6059 | 6 |
| 175.483337 | 23.30 | 47.31 | 23.54 | 63.49 | 6053 | 6 |
| 175.554138 | 34.97 | 76.85 | 62.86 | 115.45 | 6048 | 56 |
| 175.625076 | 26.54 | 82.10 | 59.35 | 116.78 | 6028 | 32 |
| 175.695862 | 23.30 | 57.43 | 44.16 | 89.26 | 6042 | 32 |
| 175.766678 | 30.71 | 80.26 | 86.89 | 139.35 | 6049 | 56 |
| 175.837540 | 29.85 | 84.40 | 71.08 | 130.46 | 6038 | 56 |
| 175.908386 | 36.32 | 86.52 | 73.06 | 133.25 | 6037 | 27 |
| 175.971909 | 45.83 | 79.03 | 84.35 | 142.64 | 4781 | 27 |
| 176.006607 | 37.36 | 52.59 | 48.87 | 86.46 | 1127 | 39 |
| 176.048630 | 39.61 | 91.99 | 62.23 | 133.89 | 6043 | 39 |
| 176.119446 | 34.88 | 63.46 | 38.22 | 91.36 | 6059 | 39 |
| 176.190399 | 30.62 | 80.19 | 44.68 | 106.78 | 6024 | 27 |
| 176.261124 | 36.57 | 90.42 | 80.65 | 141.21 | 6048 | 27 |
| 176.331940 | 28.69 | 57.33 | 38.40 | 83.55 | 6052 | 27 |
| 176.402771 | 25.08 | 42.01 | 30.19 | 64.72 | 6055 | 9 |
| 176.473618 | 23.97 | 49.50 | 31.13 | 70.41 | 6054 | 9 |
| 176.544464 | 28.91 | 49.69 | 26.32 | 70.27 | 6050 | 5 |
| 176.615280 | 31.16 | 53.48 | 26.32 | 74.45 | 6052 | 5 |
| 176.686127 | 29.61 | 47.02 | 24.89 | 70.20 | 6051 | 4 |
| 176.756973 | 27.48 | 45.24 | 29.47 | 69.62 | 6055 | 4 |
| 176.827805 | 28.33 | 45.44 | 29.06 | 69.15 | 6049 | 4 |
| 176.898651 | 33.16 | 46.85 | 36.59 | 78.54 | 6057 | 7 |
| 176.967056 | 40.45 | 52.93 | 35.00 | 85.82 | 5634 | 7 |
| 177.001740 | 45.69 | 89.82 | 20.31 | 103.03 | 293 | 5 |
| 177.038849 | 41.33 | 53.40 | 33.59 | 86.36 | 6046 | 5 |
| 177.109726 | 38.42 | 54.56 | 31.59 | 83.26 | 6054 | 5 |
| 177.180573 | 34.38 | 57.26 | 27.62 | 79.22 | 6064 | 3 |
| 177.251373 | 34.87 | 44.77 | 20.33 | 64.97 | 6053 | 3 |
| 177.322205 | 29.61 | 37.78 | 19.97 | 59.34 | 6059 | 3 |
| 177.393051 | 25.27 | 39.49 | 21.83 | 58.05 | 6060 | 3 |
| 177.463882 | 23.35 | 44.21 | 21.04 | 60.77 | 6055 | 3 |
| 177.534714 | 28.02 | 52.42 | 33.63 | 76.10 | 6052 | 3 |
| 177.605560 | 28.64 | 57.63 | 34.31 | 81.40 | 6050 | 3 |
| 177.676407 | 26.60 | 59.09 | 35.83 | 82.43 | 6054 | 3 |
| 177.747238 | 23.99 | 48.43 | 38.88 | 75.09 | 6045 | 3 |
| 177.818085 | 26.48 | 45.91 | 40.07 | 76.73 | 6055 | 6 |
| 177.888931 | 31.27 | 47.56 | 52.91 | 88.95 | 6054 | 18 |
| 177.959717 | 35.28 | 51.14 | 43.78 | 87.61 | 6052 | 18 |
| 177.997574 | 15.18 | 49.92 | 12.26 | 57.54 | 415 | 18 |
| 178.031952 | 41.36 | 63.19 | 53.70 | 106.17 | 5460 | 12 |
| 178.099335 | 39.14 | 90.60 | 82.91 | 148.19 | 6043 | 12 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|----|
| 178.170181 | 31.44 | 122.61 | 96.73 | 178.88 | 6043 | 18 |
| 178.240997 | 34.33 | 103.20 | 84.86 | 151.82 | 6053 | 18 |
| 178.311798 | 31.26 | 99.45 | 77.72 | 142.86 | 6051 | 32 |
| 178.382660 | 32.47 | 118.94 | 98.62 | 175.61 | 6050 | 48 |
| 178.453491 | 30.25 | 89.35 | 90.63 | 146.34 | 6055 | 48 |
| 178.524323 | 30.98 | 86.89 | 67.90 | 130.97 | 6036 | 56 |
| 178.667145 | 37.88 | 87.82 | 70.91 | 135.84 | 5852 | 32 |
| 178.736832 | 40.29 | 88.75 | 86.64 | 149.17 | 6052 | 32 |
| 178.807678 | 37.91 | 76.93 | 72.99 | 128.07 | 6053 | 80 |
| 178.878510 | 37.51 | 80.70 | 90.95 | 143.90 | 6057 | 39 |
| 178.949356 | 44.03 | 81.14 | 72.30 | 133.85 | 6058 | 39 |
| 178.992371 | 40.61 | 106.92 | 71.95 | 152.76 | 1305 | 39 |
| 179.027130 | 48.51 | 70.74 | 59.27 | 118.82 | 4621 | 32 |
| 179.089569 | 40.97 | 81.03 | 47.23 | 115.13 | 6054 | 32 |
| 179.160370 | 36.91 | 62.40 | 41.65 | 94.83 | 6045 | 12 |
| 179.231232 | 36.51 | 60.68 | 32.63 | 84.42 | 6054 | 12 |
| 179.302094 | 32.48 | 63.02 | 42.79 | 93.71 | 6061 | 15 |
| 179.372955 | 25.17 | 57.51 | 43.65 | 86.64 | 6053 | 15 |
| 179.442993 | 26.24 | 50.16 | 37.56 | 76.60 | 5880 | 9 |
| 179.514572 | 34.42 | 53.61 | 49.50 | 90.19 | 6050 | 22 |
| 179.585403 | 34.00 | 54.80 | 51.89 | 91.24 | 6051 | 22 |
| 179.656219 | 31.78 | 48.15 | 48.06 | 82.53 | 6050 | 15 |
| 179.727112 | 31.27 | 48.52 | 51.99 | 87.58 | 6053 | 15 |
| 179.797943 | 29.89 | 62.69 | 71.92 | 109.69 | 6053 | 15 |
| 179.868790 | 27.87 | 65.59 | 68.42 | 108.71 | 6051 | 15 |
| 179.939606 | 34.35 | 65.64 | 80.50 | 119.58 | 6058 | 22 |
| 179.987488 | 45.84 | 121.52 | 109.45 | 186.00 | 2135 | 22 |
| 180.022263 | 37.85 | 74.22 | 81.39 | 130.54 | 3796 | 15 |
| 180.079865 | 37.99 | 93.81 | 85.19 | 151.24 | 6054 | 15 |
| 180.150696 | 33.78 | 96.72 | 71.04 | 144.22 | 6058 | 15 |
| 180.221512 | 33.16 | 55.23 | 55.04 | 94.23 | 6058 | 15 |
| 180.292603 | 31.24 | 49.21 | 56.03 | 89.94 | 5936 | 5 |
| 180.363190 | 23.85 | 53.70 | 68.90 | 101.98 | 6058 | 5 |
| 180.434021 | 24.34 | 55.37 | 74.81 | 105.75 | 6058 | 5 |
| 180.504837 | 33.20 | 47.33 | 73.81 | 102.63 | 6051 | 7 |
| 180.575653 | 35.93 | 43.62 | 86.00 | 114.31 | 6050 | 7 |
| 180.646500 | 37.52 | 51.22 | 91.55 | 126.18 | 6050 | 7 |
| 180.717407 | 37.33 | 57.36 | 69.00 | 110.10 | 6049 | 7 |
| 180.794022 | 34.86 | 48.11 | 59.22 | 94.40 | 4264 | 7 |
| 180.859055 | 39.29 | 59.91 | 60.83 | 105.06 | 6052 | 7 |
| 180.929901 | 41.05 | 68.46 | 60.98 | 114.38 | 6059 | 15 |
| 180.982620 | 48.59 | 76.08 | 41.80 | 109.09 | 2961 | 15 |
| 181.017380 | 34.82 | 80.31 | 69.39 | 129.69 | 2964 | 18 |
| 181.070145 | 46.96 | 107.24 | 86.95 | 167.42 | 6056 | 18 |
| 181.140991 | 38.81 | 107.60 | 69.71 | 155.96 | 6052 | 9 |
| 181.211792 | 38.68 | 86.41 | 66.82 | 129.47 | 6058 | 9 |
| 181.282639 | 41.42 | 91.83 | 61.35 | 133.39 | 6056 | 12 |
| 181.359985 | 27.36 | 50.36 | 56.59 | 95.33 | 4881 | 12 |
| 181.424316 | 28.20 | 51.81 | 39.70 | 84.37 | 6059 | 4 |
| 181.495148 | 31.40 | 52.53 | 40.39 | 85.38 | 6051 | 4 |
| 181.565964 | 35.36 | 58.41 | 47.16 | 97.88 | 6049 | 6 |
| 181.636841 | 37.29 | 45.12 | 41.47 | 86.24 | 6040 | 5 |
| 181.707642 | 38.77 | 45.84 | 37.62 | 82.22 | 6046 | 5 |
| 181.778488 | 36.88 | 45.97 | 40.27 | 82.74 | 6054 | 3 |
| 181.849335 | 33.81 | 49.76 | 36.94 | 82.30 | 6053 | 3 |
| 181.920166 | 36.58 | 55.08 | 45.32 | 91.72 | 6057 | 5 |
| 181.977768 | 38.73 | 69.87 | 33.89 | 97.19 | 3789 | 5 |
| 182.012497 | 41.73 | 58.17 | 64.36 | 108.69 | 2137 | 2 |
| 182.060410 | 39.14 | 68.69 | 47.92 | 104.18 | 6055 | 2 |
| 182.131256 | 38.24 | 55.13 | 40.77 | 92.75 | 6059 | 2 |
| 182.202148 | 37.25 | 44.86 | 44.14 | 86.33 | 5996 | 2 |
| 182.272919 | 39.59 | 40.22 | 45.27 | 84.78 | 6050 | 2 |
| 182.343750 | 32.91 | 36.61 | 46.62 | 80.94 | 6060 | 2 |
| 182.414612 | 26.99 | 47.07 | 55.63 | 89.75 | 6050 | 5 |
| 182.485413 | 28.94 | 52.19 | 47.24 | 88.52 | 6053 | 5 |
| 182.556244 | 26.32 | 61.37 | 29.15 | 80.68 | 6052 | 4 |
| 182.627075 | 29.94 | 62.27 | 31.97 | 83.42 | 6056 | 5 |
| 182.697922 | 27.83 | 48.66 | 28.29 | 71.69 | 6048 | 5 |
| 182.768738 | 25.13 | 44.66 | 33.68 | 69.90 | 6043 | 9 |
| 182.839615 | 28.05 | 48.44 | 38.48 | 77.40 | 6047 | 9 |
| 182.910446 | 31.65 | 54.21 | 43.70 | 86.01 | 6054 | 6 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 182.972931 | 39.27 | 67.90 | 53.23 | 107.27 | 4621 | 6 |
| 183.007645 | 36.11 | 41.68 | 18.78 | 60.44 | 1308 | 9 |
| 183.050690 | 38.38 | 74.14 | 52.50 | 110.88 | 6048 | 9 |
| 183.121521 | 33.59 | 74.45 | 44.23 | 105.55 | 6061 | 9 |
| 183.192383 | 33.61 | 49.17 | 31.58 | 75.43 | 6061 | 4 |
| 183.263199 | 35.76 | 64.04 | 39.33 | 91.83 | 6054 | 9 |
| 183.334015 | 28.44 | 54.76 | 31.32 | 78.26 | 6051 | 9 |
| 183.404861 | 24.47 | 46.23 | 32.22 | 68.89 | 6056 | 5 |
| 183.478836 | 27.09 | 51.92 | 24.90 | 69.91 | 5436 | 5 |
| 183.546524 | 28.95 | 53.94 | 23.31 | 71.48 | 6042 | 4 |
| 183.617355 | 32.03 | 53.97 | 27.35 | 74.50 | 6054 | 4 |
| 183.688232 | 26.08 | 64.89 | 26.43 | 83.33 | 6051 | 3 |
| 183.759064 | 22.58 | 52.30 | 29.47 | 70.41 | 6040 | 12 |
| 183.829880 | 23.89 | 47.04 | 35.26 | 72.91 | 6056 | 12 |
| 183.900711 | 29.37 | 48.03 | 37.98 | 76.13 | 6055 | 9 |
| 183.968079 | 35.91 | 52.63 | 33.08 | 81.23 | 5455 | 9 |
| 184.002792 | 50.20 | 58.14 | 20.45 | 80.81 | 474 | 4 |
| 184.040970 | 37.72 | 55.67 | 31.10 | 83.80 | 6050 | 4 |
| 184.111816 | 35.66 | 59.95 | 34.91 | 87.74 | 6057 | 4 |
| 184.182663 | 34.65 | 58.11 | 27.05 | 80.05 | 6062 | 6 |
| 184.253433 | 34.88 | 43.57 | 20.69 | 64.86 | 6049 | 4 |
| 184.324310 | 29.58 | 48.89 | 25.95 | 69.52 | 6051 | 4 |
| 184.395142 | 23.88 | 42.08 | 22.86 | 60.22 | 6057 | 3 |
| 184.465958 | 25.71 | 38.97 | 26.12 | 60.43 | 6053 | 3 |
| 184.536789 | 29.69 | 48.48 | 24.67 | 68.34 | 6052 | 4 |
| 184.607620 | 31.18 | 51.25 | 27.87 | 73.00 | 6052 | 4 |
| 184.678497 | 27.71 | 50.61 | 32.89 | 73.42 | 6053 | 5 |
| 184.749313 | 22.94 | 42.90 | 32.57 | 65.96 | 6043 | 5 |
| 184.820145 | 24.33 | 47.02 | 36.76 | 72.09 | 6055 | 4 |
| 184.890991 | 27.78 | 52.79 | 35.93 | 77.78 | 6052 | 4 |
| 184.961823 | 36.34 | 52.91 | 33.82 | 82.70 | 6055 | 4 |
| 184.998596 | 20.41 | 51.95 | 8.10 | 58.11 | 235 | 4 |
| 185.033005 | 38.03 | 56.42 | 43.35 | 91.77 | 5638 | 7 |
| 185.101379 | 34.70 | 66.96 | 34.16 | 92.41 | 6054 | 7 |
| 185.172195 | 34.77 | 56.30 | 33.24 | 81.55 | 6058 | 6 |
| 185.243057 | 35.03 | 51.60 | 29.22 | 76.84 | 6042 | 6 |
| 185.313904 | 28.57 | 48.09 | 31.97 | 72.85 | 6053 | 5 |
| 185.384720 | 25.23 | 49.22 | 31.29 | 71.44 | 6057 | 7 |
| 185.455566 | 24.36 | 57.61 | 46.60 | 87.11 | 6052 | 7 |
| 185.526382 | 27.54 | 64.86 | 55.44 | 100.59 | 6043 | 12 |
| 185.597214 | 27.17 | 67.21 | 34.68 | 88.27 | 6049 | 12 |
| 185.668060 | 25.89 | 59.87 | 31.24 | 80.70 | 6054 | 6 |
| 185.738907 | 23.62 | 48.17 | 28.95 | 68.62 | 6048 | 6 |
| 185.809738 | 24.50 | 50.50 | 34.30 | 74.13 | 6046 | 7 |
| 185.880615 | 27.13 | 45.10 | 39.67 | 76.36 | 6053 | 12 |
| 185.951401 | 32.75 | 61.00 | 37.74 | 86.41 | 6054 | 12 |
| 185.993408 | 21.96 | 69.17 | 54.79 | 101.61 | 1125 | 12 |
| 186.028137 | 42.28 | 72.12 | 56.03 | 112.55 | 4797 | 9 |
| 186.091660 | 36.72 | 69.30 | 43.23 | 100.83 | 6051 | 9 |
| 186.162506 | 31.41 | 79.69 | 36.44 | 103.85 | 6064 | 7 |
| 186.233353 | 30.72 | 60.14 | 24.65 | 79.10 | 6052 | 7 |
| 186.304184 | 28.28 | 50.89 | 23.04 | 70.16 | 6062 | 3 |
| 186.375031 | 21.81 | 42.47 | 22.47 | 59.13 | 6059 | 7 |
| 186.445862 | 21.32 | 52.34 | 32.90 | 73.76 | 6049 | 7 |
| 186.516663 | 24.00 | 54.66 | 32.50 | 73.94 | 6048 | 18 |
| 186.587494 | 27.96 | 62.44 | 33.81 | 85.06 | 6051 | 18 |
| 186.658340 | 26.38 | 76.77 | 28.06 | 94.42 | 6055 | 7 |
| 186.729202 | 23.65 | 50.96 | 46.58 | 85.48 | 6054 | 7 |
| 186.800034 | 23.78 | 46.62 | 40.13 | 75.69 | 6051 | 7 |
| 186.870880 | 22.74 | 62.55 | 43.37 | 88.99 | 6054 | 7 |
| 186.941711 | 26.99 | 56.87 | 37.95 | 83.15 | 6053 | 6 |
| 186.988556 | 35.15 | 74.51 | 78.70 | 125.92 | 1956 | 6 |
| 187.023315 | 30.36 | 58.26 | 28.53 | 82.79 | 3970 | 5 |
| 187.081955 | 30.82 | 59.78 | 42.59 | 90.46 | 6055 | 5 |
| 187.152802 | 29.53 | 58.54 | 33.17 | 82.14 | 6060 | 6 |
| 187.223602 | 30.51 | 53.77 | 26.02 | 74.60 | 6054 | 6 |
| 187.294464 | 28.12 | 68.55 | 38.26 | 93.73 | 6060 | 9 |
| 187.365295 | 23.11 | 77.29 | 45.66 | 102.92 | 6051 | 9 |
| 187.436127 | 21.00 | 70.94 | 50.79 | 102.03 | 6052 | 12 |
| 187.506927 | 21.52 | 54.58 | 37.62 | 78.26 | 6044 | 18 |
| 187.577774 | 27.32 | 57.46 | 44.02 | 90.77 | 6054 | 18 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 187.648590 | 24.36 | 58.97 | 44.32 | 88.65 | 6055 | 15 |
| 187.719482 | 24.58 | 52.32 | 41.43 | 82.92 | 6046 | 15 |
| 187.790298 | 25.69 | 53.52 | 40.52 | 82.38 | 6042 | 6 |
| 187.861130 | 24.17 | 48.51 | 33.83 | 74.23 | 6047 | 6 |
| 187.931992 | 28.54 | 62.99 | 42.04 | 91.60 | 6054 | 3 |
| 187.983688 | 34.25 | 57.49 | 59.61 | 101.78 | 2784 | 3 |
| 188.018433 | 27.14 | 59.10 | 25.61 | 79.35 | 3145 | 3 |
| 188.072250 | 32.29 | 60.56 | 42.62 | 91.59 | 6054 | 3 |
| 188.143051 | 29.16 | 60.70 | 40.79 | 88.49 | 6060 | 5 |
| 188.213928 | 30.31 | 46.42 | 31.09 | 72.36 | 6051 | 5 |
| 188.284729 | 28.41 | 46.12 | 22.06 | 65.60 | 6062 | 5 |
| 188.355576 | 23.09 | 49.82 | 32.22 | 71.66 | 6058 | 5 |
| 188.426407 | 21.29 | 43.85 | 31.33 | 66.37 | 6056 | 4 |
| 188.497238 | 24.31 | 46.74 | 39.62 | 75.03 | 6050 | 4 |
| 188.568039 | 29.03 | 43.13 | 40.62 | 75.57 | 6050 | 7 |
| 188.638885 | 28.30 | 61.68 | 41.64 | 87.91 | 6050 | 6 |
| 188.709747 | 25.43 | 49.93 | 42.53 | 81.80 | 6044 | 6 |
| 188.780563 | 26.06 | 52.73 | 40.70 | 83.27 | 6050 | 7 |
| 188.851425 | 23.40 | 54.88 | 36.63 | 79.62 | 6053 | 7 |
| 188.922272 | 26.77 | 52.90 | 41.08 | 81.89 | 6060 | 5 |
| 188.978806 | 26.49 | 63.97 | 63.80 | 105.28 | 3611 | 5 |
| 189.013550 | 32.85 | 61.67 | 19.61 | 80.60 | 2315 | 7 |
| 189.062515 | 29.98 | 64.03 | 51.10 | 99.40 | 6054 | 7 |
| 189.131882 | 28.57 | 57.76 | 44.70 | 88.94 | 5780 | 5 |
| 189.205399 | 37.26 | 51.59 | 29.23 | 76.99 | 5840 | 5 |
| 189.274994 | 36.02 | 49.99 | 22.23 | 71.09 | 6055 | 4 |
| 189.345810 | 29.06 | 48.38 | 27.58 | 70.66 | 6052 | 4 |
| 189.416672 | 25.87 | 40.95 | 24.54 | 62.29 | 6057 | 5 |
| 189.487503 | 26.35 | 44.90 | 22.17 | 63.73 | 6049 | 5 |
| 189.558334 | 27.40 | 50.09 | 24.58 | 67.58 | 6053 | 4 |
| 189.629150 | 28.86 | 58.15 | 31.97 | 80.62 | 6054 | 4 |
| 189.699997 | 26.82 | 49.40 | 29.33 | 70.38 | 6053 | 4 |
| 189.770828 | 23.31 | 42.01 | 34.77 | 67.74 | 6051 | 6 |
| 189.841690 | 24.99 | 46.64 | 33.74 | 70.57 | 6047 | 6 |
| 189.912521 | 29.72 | 58.14 | 40.96 | 86.78 | 6055 | 6 |
| 189.973938 | 34.68 | 61.16 | 39.73 | 89.55 | 4443 | 6 |
| 190.008667 | 35.60 | 33.04 | 21.73 | 60.29 | 1484 | 6 |
| 190.052750 | 36.17 | 60.71 | 32.81 | 87.95 | 6052 | 6 |
| 190.123611 | 38.28 | 57.35 | 35.32 | 87.39 | 6063 | 6 |
| 190.194443 | 34.03 | 60.20 | 36.39 | 89.42 | 6058 | 7 |
| 190.265259 | 34.48 | 53.53 | 22.02 | 73.47 | 6061 | 3 |
| 190.336105 | 27.37 | 44.98 | 21.15 | 63.40 | 6060 | 3 |
| 190.406937 | 25.29 | 41.99 | 23.49 | 61.60 | 6051 | 6 |
| 190.477753 | 26.95 | 49.57 | 32.58 | 72.54 | 6049 | 6 |
| 190.548584 | 28.60 | 54.36 | 37.99 | 81.29 | 6052 | 9 |
| 190.619446 | 29.90 | 49.43 | 54.55 | 90.92 | 6046 | 9 |
| 190.690277 | 26.48 | 46.81 | 50.29 | 85.81 | 6054 | 9 |
| 190.761093 | 20.39 | 49.62 | 46.39 | 80.19 | 6043 | 6 |
| 190.831955 | 23.47 | 49.11 | 38.21 | 76.18 | 6053 | 6 |
| 190.902786 | 29.09 | 48.17 | 44.40 | 81.13 | 6053 | 2 |
| 190.969101 | 36.43 | 46.49 | 38.11 | 83.15 | 5278 | 2 |
| 191.003479 | 57.24 | 43.04 | 12.94 | 75.74 | 591 | 3 |
| 191.042328 | 40.12 | 52.78 | 39.90 | 89.64 | 6048 | 3 |
| 191.113190 | 41.00 | 57.90 | 27.90 | 85.95 | 6056 | 3 |
| 191.184021 | 38.12 | 45.78 | 28.18 | 74.11 | 6061 | 4 |
| 191.254852 | 40.09 | 57.16 | 23.54 | 81.04 | 6061 | 6 |
| 191.325699 | 33.18 | 61.91 | 36.28 | 89.40 | 6058 | 6 |
| 191.396530 | 30.54 | 41.66 | 22.95 | 63.85 | 6057 | 6 |
| 191.467361 | 28.11 | 52.74 | 36.18 | 78.12 | 6049 | 6 |
| 191.538177 | 30.44 | 55.22 | 41.02 | 85.59 | 6047 | 6 |
| 191.609009 | 31.32 | 56.77 | 33.58 | 81.20 | 6051 | 6 |
| 191.679855 | 28.63 | 48.61 | 27.66 | 71.36 | 6051 | 5 |
| 191.750687 | 21.74 | 50.21 | 34.52 | 71.61 | 6040 | 6 |
| 191.821564 | 22.96 | 46.72 | 42.66 | 77.56 | 6044 | 6 |
| 191.892380 | 30.87 | 45.66 | 38.13 | 75.06 | 6058 | 9 |
| 191.963211 | 38.35 | 57.02 | 46.63 | 93.40 | 6052 | 9 |
| 191.999298 | 25.03 | 76.81 | 20.64 | 83.85 | 118 | 9 |
| 192.034042 | 40.06 | 63.80 | 44.02 | 100.36 | 5806 | 6 |
| 192.103470 | 40.13 | 57.14 | 36.27 | 89.50 | 6055 | 6 |
| 192.174286 | 37.65 | 46.96 | 32.70 | 76.55 | 6035 | 9 |
| 192.245132 | 39.87 | 66.45 | 51.81 | 104.29 | 6055 | 9 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|-----|
| 192.315979 | 32.63 | 80.25 | 80.47 | 135.64 | 6056 | 27 |
| 192.386810 | 29.45 | 80.84 | 46.24 | 109.12 | 6058 | 18 |
| 192.457703 | 29.07 | 54.21 | 39.09 | 81.88 | 6034 | 18 |
| 192.528549 | 32.54 | 69.83 | 54.59 | 106.64 | 6021 | 22 |
| 192.599289 | 31.79 | 66.68 | 32.08 | 88.68 | 6057 | 22 |
| 192.670120 | 30.35 | 56.56 | 34.53 | 81.45 | 6044 | 22 |
| 192.740997 | 22.52 | 46.24 | 49.61 | 80.88 | 6049 | 22 |
| 192.811859 | 24.42 | 63.96 | 44.35 | 91.81 | 6041 | 39 |
| 192.882660 | 27.12 | 49.24 | 46.35 | 83.62 | 6059 | 15 |
| 192.953491 | 31.85 | 47.10 | 47.84 | 88.16 | 6059 | 15 |
| 192.994431 | 18.82 | 51.59 | 29.18 | 65.11 | 949 | 15 |
| 193.029221 | 42.35 | 57.91 | 36.34 | 96.87 | 4966 | 18 |
| 193.093765 | 36.66 | 66.67 | 35.48 | 95.46 | 6049 | 18 |
| 193.164673 | 32.86 | 75.42 | 65.02 | 118.99 | 6013 | 32 |
| 193.235474 | 28.38 | 86.60 | 45.92 | 114.65 | 6031 | 32 |
| 193.306290 | 29.71 | 89.02 | 49.33 | 118.77 | 6045 | 18 |
| 193.377182 | 24.38 | 70.00 | 53.72 | 102.38 | 6018 | 32 |
| 193.447952 | 26.60 | 85.74 | 64.42 | 123.35 | 6047 | 32 |
| 193.518784 | 31.12 | 69.34 | 75.88 | 121.86 | 6029 | 56 |
| 193.589554 | 34.42 | 71.75 | 97.92 | 141.53 | 6047 | 56 |
| 193.660431 | 31.16 | 53.31 | 59.23 | 100.26 | 6047 | 32 |
| 193.731262 | 21.37 | 68.38 | 41.20 | 92.72 | 6047 | 32 |
| 193.802109 | 25.25 | 67.44 | 67.47 | 112.40 | 6049 | 32 |
| 193.872971 | 28.05 | 82.78 | 76.43 | 130.91 | 6046 | 32 |
| 193.943802 | 32.42 | 69.48 | 67.42 | 115.55 | 6038 | 48 |
| 193.989563 | 32.10 | 147.76 | 81.17 | 193.01 | 1781 | 48 |
| 194.024323 | 42.31 | 70.74 | 79.52 | 131.73 | 4148 | 22 |
| 194.084015 | 36.09 | 69.77 | 59.12 | 109.63 | 6055 | 22 |
| 194.154861 | 36.81 | 63.28 | 42.03 | 94.00 | 6063 | 12 |
| 194.225677 | 38.37 | 47.77 | 28.32 | 73.29 | 6057 | 12 |
| 194.296524 | 37.30 | 49.72 | 24.92 | 74.16 | 6059 | 5 |
| 194.367355 | 31.09 | 44.38 | 23.25 | 65.54 | 6053 | 5 |
| 194.438217 | 26.01 | 39.51 | 24.05 | 59.90 | 6050 | 9 |
| 194.509033 | 29.79 | 45.72 | 29.49 | 69.91 | 6055 | 3 |
| 194.579849 | 31.00 | 53.36 | 24.48 | 73.94 | 6050 | 3 |
| 194.650665 | 29.96 | 48.47 | 29.15 | 72.20 | 6055 | 6 |
| 194.721542 | 24.01 | 62.05 | 40.69 | 87.17 | 6054 | 6 |
| 194.792389 | 23.67 | 58.12 | 37.88 | 82.37 | 6051 | 6 |
| 194.863220 | 27.23 | 55.52 | 39.45 | 82.68 | 6053 | 6 |
| 194.934052 | 33.87 | 53.84 | 37.28 | 83.22 | 6058 | 6 |
| 194.984741 | 43.65 | 66.91 | 64.29 | 112.50 | 2602 | 6 |
| 195.019470 | 32.15 | 48.23 | 33.99 | 76.81 | 3313 | 4 |
| 195.074310 | 37.64 | 58.22 | 49.86 | 97.05 | 6052 | 4 |
| 195.145126 | 33.56 | 59.82 | 44.95 | 91.28 | 6057 | 7 |
| 195.215958 | 34.43 | 47.24 | 42.59 | 80.81 | 6060 | 7 |
| 195.286789 | 32.24 | 55.13 | 50.55 | 90.82 | 6055 | 9 |
| 195.357651 | 26.30 | 50.64 | 57.16 | 90.00 | 6051 | 9 |
| 195.428482 | 27.53 | 81.84 | 78.42 | 129.00 | 6049 | 67 |
| 195.499420 | 31.84 | 86.27 | 87.65 | 142.29 | 6014 | 67 |
| 195.570190 | 35.43 | 100.04 | 109.59 | 172.60 | 6028 | 132 |
| 195.640991 | 41.06 | 77.62 | 141.95 | 188.44 | 6036 | 94 |
| 195.786987 | 23.69 | 51.86 | 63.97 | 96.16 | 5313 | 12 |
| 195.853455 | 25.23 | 59.07 | 59.73 | 99.89 | 6048 | 12 |
| 195.924347 | 31.71 | 60.30 | 66.35 | 110.35 | 6057 | 15 |
| 195.979828 | 29.81 | 69.96 | 59.81 | 108.56 | 3430 | 15 |
| 196.014236 | 41.16 | 64.83 | 41.11 | 97.96 | 2435 | 15 |
| 196.063889 | 37.32 | 78.81 | 48.27 | 111.66 | 6053 | 15 |
| 196.134689 | 34.98 | 73.66 | 41.97 | 104.10 | 6054 | 15 |
| 196.205551 | 35.92 | 70.35 | 38.21 | 96.03 | 6058 | 15 |
| 196.276382 | 32.98 | 69.80 | 38.97 | 95.29 | 6063 | 18 |
| 196.347229 | 26.65 | 55.02 | 34.44 | 79.36 | 6058 | 18 |
| 196.418060 | 24.61 | 60.83 | 47.57 | 93.79 | 6054 | 27 |
| 196.488892 | 25.70 | 60.95 | 56.80 | 101.01 | 6054 | 27 |
| 196.559692 | 27.42 | 52.74 | 36.74 | 80.52 | 6053 | 27 |
| 196.630539 | 27.24 | 69.20 | 50.99 | 100.66 | 6047 | 154 |
| 196.701401 | 30.55 | 73.99 | 79.51 | 129.85 | 6054 | 154 |
| 196.772293 | 35.13 | 118.36 | 119.44 | 187.46 | 6035 | 111 |
| 196.843582 | 34.29 | 86.66 | 91.29 | 145.26 | 5904 | 111 |
| 196.913925 | 38.56 | 71.21 | 54.99 | 113.93 | 6044 | 39 |
| 196.974625 | 42.52 | 61.86 | 41.27 | 104.46 | 4317 | 39 |
| 197.009369 | 32.71 | 62.15 | 36.70 | 86.36 | 1606 | 15 |

| | | | | | | |
|------------|--------|--------|--------|--------|------|-----|
| 197.054153 | 38.64 | 71.52 | 43.93 | 104.77 | 6050 | 15 |
| 197.125015 | 41.34 | 81.86 | 51.11 | 117.12 | 6049 | 22 |
| 197.195831 | 35.12 | 82.78 | 48.20 | 113.80 | 6061 | 22 |
| 197.266708 | 31.64 | 62.92 | 26.94 | 82.02 | 6047 | 39 |
| 197.337494 | 31.33 | 81.61 | 61.03 | 122.81 | 6045 | 39 |
| 197.408340 | 29.81 | 91.81 | 77.24 | 138.50 | 6045 | 32 |
| 197.479172 | 42.57 | 105.07 | 81.91 | 159.66 | 6056 | 32 |
| 197.549973 | 42.99 | 94.09 | 74.65 | 147.83 | 6041 | 207 |
| 197.620819 | 47.88 | 101.82 | 72.40 | 153.01 | 6032 | 207 |
| 197.691650 | 54.61 | 142.87 | 125.83 | 228.33 | 6012 | 300 |
| 197.762589 | 72.60 | 135.84 | 172.69 | 258.97 | 6017 | 400 |
| 197.833374 | 82.98 | 289.37 | 181.49 | 381.62 | 6037 | 400 |
| 197.904160 | 125.29 | 323.53 | 202.86 | 458.36 | 6019 | 300 |
| 197.969818 | 117.14 | 240.45 | 183.08 | 378.33 | 5044 | 300 |
| 198.004517 | 53.77 | 448.27 | 71.86 | 458.52 | 772 | 179 |
| 198.044495 | 100.91 | 228.75 | 110.03 | 310.89 | 6012 | 179 |
| 198.115372 | 81.48 | 187.00 | 118.64 | 272.62 | 6032 | 179 |
| 198.186310 | 72.91 | 169.67 | 126.67 | 251.75 | 5997 | 80 |
| 198.256989 | 75.22 | 122.69 | 69.53 | 178.02 | 6041 | 32 |
| 198.327774 | 64.01 | 119.46 | 59.90 | 164.36 | 6060 | 32 |
| 198.398605 | 56.51 | 105.76 | 54.40 | 147.99 | 6053 | 39 |
| 198.469437 | 54.87 | 94.39 | 37.29 | 131.61 | 6056 | 39 |
| 198.540329 | 50.99 | 91.19 | 34.77 | 127.77 | 6035 | 39 |
| 198.611115 | 51.72 | 97.65 | 35.03 | 135.11 | 6054 | 39 |
| 198.681946 | 53.01 | 92.94 | 40.97 | 137.56 | 6051 | 15 |
| 198.752808 | 50.35 | 86.78 | 46.64 | 135.40 | 6052 | 7 |
| 198.827927 | 40.32 | 84.11 | 23.94 | 109.07 | 4906 | 7 |
| 198.894485 | 56.39 | 76.08 | 43.56 | 124.14 | 6059 | 6 |
| 198.964951 | 60.70 | 77.48 | 37.79 | 123.38 | 5999 | 6 |
| 199.035080 | 61.41 | 74.89 | 35.10 | 117.15 | 5994 | 15 |
| 199.105545 | 64.30 | 83.55 | 42.35 | 124.83 | 6054 | 15 |
| 199.176376 | 64.21 | 70.86 | 34.66 | 112.25 | 6060 | 12 |
| 199.247223 | 64.78 | 57.96 | 28.98 | 99.60 | 6051 | 12 |
| 199.318054 | 58.35 | 52.08 | 27.01 | 92.54 | 6062 | 9 |
| 199.379822 | 55.23 | 51.68 | 31.81 | 92.62 | 4476 | 9 |
| 199.459717 | 48.70 | 59.99 | 28.26 | 91.85 | 6054 | 9 |
| 199.530563 | 51.06 | 62.99 | 32.81 | 98.99 | 6048 | 9 |
| 199.601379 | 51.47 | 72.68 | 28.55 | 104.90 | 6055 | 9 |
| 199.672241 | 54.20 | 63.18 | 27.99 | 100.13 | 6049 | 5 |
| 199.743073 | 45.45 | 58.36 | 39.52 | 95.64 | 6052 | 5 |
| 199.813919 | 46.72 | 50.26 | 37.71 | 91.48 | 6044 | 4 |
| 199.885498 | 50.20 | 55.71 | 37.01 | 92.58 | 5786 | 5 |
| 199.955612 | 58.60 | 59.68 | 37.09 | 103.19 | 6050 | 5 |
| 199.995483 | 42.43 | 54.22 | 25.28 | 84.65 | 772 | 5 |
| 200.030228 | 60.85 | 69.17 | 42.51 | 112.04 | 5160 | 6 |
| 200.095840 | 60.10 | 77.31 | 47.12 | 120.30 | 6057 | 6 |
| 200.166656 | 54.79 | 74.06 | 42.92 | 111.73 | 6061 | 9 |
| 200.237473 | 48.50 | 80.81 | 49.95 | 118.63 | 6053 | 9 |
| 200.308350 | 51.42 | 54.32 | 23.99 | 86.68 | 6062 | 9 |
| 200.379166 | 45.41 | 49.02 | 25.22 | 79.57 | 6057 | 5 |
| 200.449997 | 41.90 | 53.89 | 28.74 | 82.85 | 6059 | 5 |
| 200.520828 | 43.65 | 56.87 | 34.74 | 90.64 | 6048 | 15 |
| 200.591660 | 41.17 | 58.52 | 32.94 | 90.01 | 6036 | 15 |
| 200.662506 | 42.63 | 55.33 | 37.91 | 90.66 | 6046 | 15 |
| 200.733353 | 35.13 | 57.27 | 39.55 | 89.48 | 6050 | 15 |
| 200.804199 | 35.78 | 48.81 | 34.10 | 81.15 | 6053 | 15 |
| 200.875031 | 47.45 | 55.75 | 41.05 | 95.26 | 6058 | 18 |
| 200.945862 | 52.34 | 57.43 | 39.39 | 98.04 | 6054 | 18 |
| 200.990616 | 68.84 | 62.07 | 39.09 | 114.41 | 1600 | 18 |
| 201.025040 | 53.26 | 62.61 | 37.92 | 100.56 | 4266 | 9 |
| 201.085419 | 56.50 | 64.80 | 39.75 | 106.52 | 6056 | 9 |
| 201.156250 | 51.49 | 67.33 | 31.73 | 99.46 | 6057 | 4 |
| 201.227066 | 50.96 | 51.38 | 23.84 | 83.05 | 6054 | 4 |
| 201.297913 | 51.45 | 44.95 | 18.68 | 77.23 | 6062 | 3 |
| 201.368759 | 43.08 | 45.40 | 22.45 | 73.67 | 6059 | 3 |
| 201.439590 | 38.99 | 56.22 | 32.63 | 85.84 | 6058 | 4 |
| 201.510422 | 38.99 | 56.53 | 35.04 | 87.20 | 6052 | 7 |
| 201.581268 | 35.50 | 60.73 | 27.17 | 84.43 | 6047 | 7 |
| 201.652054 | 41.09 | 65.62 | 36.37 | 95.98 | 6054 | 32 |
| 201.722977 | 33.36 | 54.35 | 48.75 | 93.23 | 6041 | 32 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|----|
| 201.793777 | 35.35 | 51.51 | 45.12 | 88.64 | 6039 | 22 |
| 201.864655 | 39.72 | 49.35 | 55.69 | 98.82 | 6046 | 22 |
| 201.935471 | 53.84 | 75.75 | 64.53 | 128.03 | 6039 | 32 |
| 201.985413 | 55.42 | 93.89 | 77.10 | 150.42 | 2488 | 32 |
| 202.020172 | 49.78 | 54.01 | 33.67 | 89.05 | 3440 | 39 |
| 202.075684 | 58.38 | 72.14 | 61.50 | 126.05 | 6049 | 39 |
| 202.146530 | 57.43 | 134.33 | 107.30 | 199.07 | 6043 | 80 |
| 202.217346 | 59.40 | 85.24 | 81.26 | 146.78 | 6055 | 80 |
| 202.288223 | 50.66 | 132.04 | 94.60 | 188.37 | 6052 | 56 |
| 202.359039 | 46.60 | 139.00 | 93.68 | 189.99 | 6058 | 56 |
| 202.429855 | 46.54 | 128.43 | 72.33 | 171.06 | 6059 | 48 |
| 202.500687 | 41.12 | 86.63 | 81.11 | 145.35 | 6052 | 27 |
| 202.571533 | 40.02 | 91.02 | 81.91 | 147.00 | 6038 | 27 |
| 202.642319 | 44.41 | 80.58 | 32.24 | 109.17 | 6046 | 9 |
| 202.713211 | 43.52 | 65.51 | 40.41 | 106.63 | 6050 | 9 |
| 202.784042 | 41.27 | 53.21 | 42.29 | 95.85 | 6039 | 18 |
| 202.854889 | 44.52 | 67.20 | 40.13 | 104.52 | 6049 | 18 |
| 202.925720 | 47.41 | 77.78 | 44.13 | 111.49 | 6055 | 15 |
| 202.980530 | 47.06 | 88.14 | 72.35 | 136.47 | 3307 | 15 |
| 203.015289 | 47.27 | 78.58 | 34.65 | 109.59 | 2610 | 12 |
| 203.066025 | 44.43 | 89.06 | 48.87 | 122.71 | 6039 | 12 |
| 203.136810 | 42.62 | 69.39 | 50.58 | 106.38 | 6059 | 7 |
| 203.207611 | 46.50 | 52.82 | 30.72 | 84.78 | 6057 | 7 |
| 203.278488 | 44.86 | 44.95 | 20.01 | 73.13 | 6062 | 4 |
| 203.349304 | 35.26 | 42.37 | 28.03 | 70.54 | 6056 | 4 |
| 203.420135 | 30.50 | 42.19 | 29.97 | 68.05 | 6054 | 5 |
| 203.490982 | 33.67 | 46.85 | 51.04 | 87.35 | 6048 | 5 |
| 203.561813 | 34.07 | 53.70 | 35.11 | 83.81 | 6053 | 9 |
| 203.632614 | 33.38 | 54.91 | 34.52 | 83.79 | 6053 | 5 |
| 203.703491 | 30.92 | 55.05 | 39.45 | 86.03 | 6056 | 5 |
| 203.774338 | 31.98 | 53.73 | 36.76 | 82.74 | 6053 | 5 |
| 203.845169 | 34.53 | 55.03 | 31.56 | 81.65 | 6055 | 5 |
| 203.911591 | 39.04 | 58.85 | 33.39 | 86.58 | 5305 | 6 |
| 203.976334 | 44.67 | 66.62 | 54.96 | 107.15 | 4038 | 6 |
| 204.010391 | 34.32 | 56.05 | 44.49 | 91.02 | 1777 | 6 |
| 204.056229 | 41.64 | 78.14 | 52.55 | 114.71 | 6044 | 6 |
| 204.127106 | 40.57 | 69.00 | 40.00 | 100.20 | 6057 | 9 |
| 204.197922 | 38.88 | 66.30 | 47.20 | 102.95 | 6060 | 9 |
| 204.268753 | 36.27 | 59.76 | 32.72 | 86.05 | 6052 | 9 |
| 204.339584 | 30.89 | 78.12 | 50.42 | 113.30 | 6058 | 9 |
| 204.410431 | 30.05 | 78.55 | 65.09 | 121.44 | 6050 | 18 |
| 204.481247 | 31.48 | 78.35 | 65.37 | 123.79 | 6047 | 18 |
| 204.552078 | 30.84 | 71.44 | 67.54 | 120.73 | 6048 | 9 |
| 204.622910 | 34.44 | 72.62 | 71.17 | 125.83 | 6057 | 9 |
| 204.693771 | 36.30 | 85.60 | 56.49 | 127.49 | 6047 | 22 |
| 204.764587 | 34.07 | 74.71 | 51.06 | 113.49 | 6046 | 15 |
| 204.835464 | 32.51 | 65.17 | 44.08 | 99.41 | 6052 | 15 |
| 204.906265 | 35.29 | 59.67 | 34.14 | 87.31 | 6050 | 7 |
| 204.970840 | 41.39 | 62.99 | 43.88 | 96.42 | 4975 | 7 |
| 205.005569 | 35.34 | 78.94 | 19.64 | 89.24 | 950 | 7 |
| 205.046539 | 42.54 | 70.93 | 48.39 | 106.25 | 6055 | 7 |
| 205.117386 | 41.28 | 72.44 | 44.15 | 104.51 | 6052 | 7 |
| 205.188202 | 38.93 | 77.40 | 41.92 | 106.65 | 6059 | 9 |
| 205.259033 | 39.56 | 53.90 | 20.89 | 76.98 | 6061 | 5 |
| 205.329880 | 32.40 | 40.89 | 17.29 | 62.04 | 6060 | 5 |
| 205.400711 | 27.25 | 39.07 | 17.84 | 57.36 | 6052 | 6 |
| 205.471512 | 27.05 | 44.87 | 28.15 | 67.82 | 6052 | 6 |
| 205.542374 | 29.56 | 57.15 | 44.03 | 86.51 | 6044 | 22 |
| 205.613205 | 33.05 | 73.18 | 46.94 | 106.39 | 6050 | 22 |
| 205.684097 | 32.60 | 86.91 | 61.89 | 130.08 | 6031 | 39 |
| 205.754883 | 34.04 | 84.00 | 71.52 | 130.92 | 6050 | 80 |
| 205.825714 | 37.45 | 89.84 | 67.46 | 139.70 | 6054 | 80 |
| 205.896576 | 40.35 | 83.17 | 52.54 | 123.64 | 6056 | 18 |
| 205.965988 | 46.41 | 81.23 | 51.64 | 120.09 | 5814 | 18 |
| 206.000702 | 39.56 | 150.70 | 33.68 | 159.48 | 117 | 9 |
| 206.036835 | 45.41 | 85.52 | 53.66 | 125.90 | 6049 | 9 |
| 206.107651 | 43.31 | 81.14 | 50.85 | 119.06 | 6048 | 9 |
| 206.178467 | 42.74 | 75.22 | 58.04 | 117.83 | 6061 | 9 |
| 206.249313 | 39.52 | 74.06 | 34.60 | 100.56 | 6056 | 9 |
| 206.320145 | 34.84 | 62.29 | 27.82 | 85.62 | 6053 | 5 |
| 206.390991 | 31.01 | 48.83 | 34.56 | 75.68 | 6059 | 2 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|----|
| 206.461807 | 28.96 | 46.82 | 34.49 | 72.66 | 6055 | 2 |
| 206.532608 | 32.65 | 50.47 | 33.12 | 77.41 | 6041 | 3 |
| 206.603470 | 32.57 | 56.23 | 31.71 | 80.45 | 6051 | 3 |
| 206.674316 | 31.23 | 59.34 | 36.03 | 86.39 | 6055 | 2 |
| 206.745148 | 34.00 | 52.14 | 39.51 | 84.54 | 6051 | 2 |
| 206.815994 | 33.96 | 51.53 | 40.49 | 85.44 | 6052 | 2 |
| 206.886826 | 36.49 | 53.96 | 41.10 | 88.46 | 6058 | 6 |
| 206.957657 | 42.86 | 56.54 | 38.88 | 91.77 | 6054 | 6 |
| 206.996521 | 18.13 | 45.12 | 18.67 | 58.30 | 591 | 6 |
| 207.030930 | 45.10 | 66.46 | 42.73 | 100.61 | 5279 | 5 |
| 207.097244 | 39.92 | 77.92 | 49.07 | 112.62 | 6043 | 5 |
| 207.168060 | 37.46 | 78.78 | 48.39 | 109.88 | 6064 | 5 |
| 207.238861 | 37.24 | 44.19 | 23.19 | 67.95 | 6046 | 5 |
| 207.309738 | 34.70 | 39.65 | 20.38 | 63.47 | 6056 | 3 |
| 207.380585 | 29.54 | 40.80 | 23.29 | 61.77 | 6059 | 4 |
| 207.451385 | 26.33 | 45.45 | 26.16 | 65.18 | 6052 | 4 |
| 207.522232 | 28.93 | 52.25 | 28.59 | 73.54 | 6050 | 6 |
| 207.593063 | 31.38 | 62.69 | 33.48 | 85.79 | 6056 | 6 |
| 207.663895 | 30.15 | 55.05 | 34.81 | 80.72 | 6052 | 7 |
| 207.734756 | 30.98 | 55.28 | 40.19 | 85.73 | 6051 | 7 |
| 207.805618 | 33.77 | 52.83 | 37.78 | 84.39 | 6047 | 5 |
| 207.876419 | 34.38 | 52.11 | 40.77 | 86.02 | 6052 | 7 |
| 207.947266 | 38.10 | 51.81 | 28.79 | 80.59 | 6058 | 7 |
| 207.991333 | 46.79 | 105.29 | 54.17 | 134.93 | 1485 | 7 |
| 208.026093 | 35.97 | 53.74 | 40.94 | 87.58 | 4441 | 7 |
| 208.087509 | 39.12 | 68.87 | 37.62 | 96.75 | 6050 | 7 |
| 208.158340 | 35.49 | 63.79 | 31.10 | 87.71 | 6058 | 9 |
| 208.229156 | 34.10 | 56.50 | 28.56 | 79.60 | 6052 | 9 |
| 208.300003 | 33.26 | 109.76 | 69.80 | 148.45 | 6054 | 18 |
| 208.368835 | 31.56 | 101.81 | 67.38 | 138.57 | 5513 | 18 |
| 208.442245 | 30.63 | 74.81 | 57.95 | 110.30 | 5205 | 12 |
| 208.512482 | 31.88 | 62.83 | 54.75 | 102.00 | 6050 | 22 |
| 208.583313 | 30.97 | 72.83 | 74.04 | 122.92 | 6051 | 22 |
| 208.654160 | 30.14 | 69.30 | 53.69 | 108.46 | 6057 | 12 |
| 208.725006 | 28.75 | 64.89 | 52.43 | 103.17 | 6045 | 12 |
| 208.795853 | 31.95 | 65.57 | 64.19 | 113.23 | 6042 | 32 |
| 208.866714 | 37.64 | 77.63 | 49.56 | 113.65 | 6049 | 32 |
| 208.937607 | 40.95 | 61.18 | 62.16 | 111.13 | 6037 | 39 |
| 208.986450 | 47.92 | 99.73 | 71.54 | 152.04 | 2308 | 39 |
| 209.021210 | 46.65 | 61.27 | 69.91 | 120.12 | 3613 | 22 |
| 209.077759 | 45.73 | 87.96 | 62.20 | 132.45 | 6055 | 22 |
| 209.148605 | 40.51 | 54.68 | 45.43 | 93.53 | 6061 | 7 |
| 209.219421 | 44.44 | 47.65 | 44.09 | 88.56 | 6053 | 7 |
| 209.290253 | 42.02 | 43.82 | 45.56 | 84.55 | 6055 | 3 |
| 209.361115 | 34.74 | 42.58 | 47.99 | 81.36 | 6058 | 3 |
| 209.431961 | 29.94 | 44.08 | 47.81 | 79.95 | 6053 | 2 |
| 209.502762 | 31.91 | 45.47 | 46.78 | 82.62 | 6055 | 3 |
| 209.573593 | 32.86 | 54.11 | 45.91 | 89.05 | 6052 | 3 |
| 209.644440 | 33.25 | 55.45 | 53.80 | 95.10 | 6052 | 4 |
| 209.790573 | 34.66 | 53.35 | 58.23 | 97.14 | 5293 | 6 |
| 209.857101 | 34.35 | 51.71 | 54.54 | 94.76 | 5999 | 6 |
| 209.927795 | 40.25 | 58.44 | 52.60 | 101.35 | 6057 | 9 |
| 209.981583 | 41.25 | 56.19 | 66.45 | 108.42 | 3139 | 9 |
| 210.016342 | 38.40 | 64.67 | 30.15 | 88.73 | 2788 | 12 |
| 210.068039 | 42.96 | 81.21 | 55.86 | 120.70 | 6056 | 12 |
| 210.138901 | 35.02 | 82.35 | 47.98 | 113.94 | 6044 | 15 |
| 210.209717 | 33.01 | 98.08 | 60.98 | 133.83 | 6059 | 15 |
| 210.280609 | 35.49 | 116.43 | 75.58 | 160.35 | 5978 | 39 |
| 210.351379 | 34.53 | 82.49 | 94.51 | 149.34 | 6044 | 39 |
| 210.422226 | 29.47 | 67.52 | 46.49 | 99.21 | 6053 | 32 |
| 210.493134 | 32.09 | 66.01 | 60.84 | 108.66 | 6025 | 32 |
| 210.563934 | 41.80 | 78.69 | 75.53 | 134.49 | 6034 | 67 |
| 210.634705 | 46.90 | 72.29 | 77.87 | 138.83 | 6045 | 67 |
| 210.705627 | 61.43 | 120.04 | 120.71 | 209.36 | 5976 | 67 |
| 210.776428 | 55.08 | 80.65 | 51.50 | 130.62 | 6039 | 18 |
| 210.847229 | 44.52 | 58.71 | 35.33 | 98.01 | 6050 | 18 |
| 210.918076 | 45.06 | 60.67 | 34.13 | 95.84 | 6056 | 6 |
| 210.976685 | 45.76 | 86.69 | 45.05 | 120.01 | 3960 | 6 |
| 211.011459 | 57.35 | 53.88 | 18.34 | 91.53 | 1960 | 27 |
| 211.058334 | 49.14 | 93.47 | 70.05 | 146.23 | 6048 | 27 |
| 211.129166 | 42.29 | 103.81 | 62.42 | 144.13 | 6050 | 22 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 211.200027 | 38.14 | 97.04 | 78.02 | 144.81 | 6046 | 22 |
| 211.270828 | 37.52 | 142.15 | 74.43 | 179.42 | 6048 | 22 |
| 211.341660 | 36.97 | 99.81 | 54.41 | 134.74 | 6062 | 22 |
| 211.412491 | 43.37 | 99.19 | 85.78 | 155.39 | 6051 | 67 |
| 211.483246 | 49.25 | 83.72 | 95.01 | 152.49 | 6030 | 67 |
| 211.554169 | 44.35 | 67.60 | 47.04 | 109.82 | 6045 | 39 |
| 211.624985 | 45.81 | 57.61 | 41.21 | 100.14 | 6049 | 39 |
| 211.695847 | 47.27 | 55.73 | 36.49 | 97.00 | 6051 | 18 |
| 211.766663 | 49.69 | 55.07 | 35.47 | 97.75 | 6049 | 9 |
| 211.837494 | 43.25 | 67.32 | 30.65 | 99.75 | 6054 | 9 |
| 211.908340 | 48.05 | 62.00 | 41.00 | 102.19 | 6056 | 12 |
| 211.971893 | 56.96 | 59.84 | 35.91 | 104.16 | 4799 | 12 |
| 212.006256 | 24.34 | 54.77 | 15.41 | 64.69 | 1069 | 12 |
| 212.047928 | 48.91 | 71.13 | 35.72 | 103.34 | 6051 | 12 |
| 212.118744 | 42.56 | 88.43 | 67.01 | 135.25 | 6061 | 12 |
| 212.189590 | 34.55 | 76.81 | 50.30 | 111.46 | 6063 | 15 |
| 212.260422 | 33.85 | 40.48 | 22.45 | 63.87 | 6062 | 4 |
| 212.331268 | 32.55 | 37.63 | 23.52 | 62.14 | 6055 | 4 |
| 212.402084 | 28.55 | 35.72 | 21.57 | 58.26 | 6052 | 5 |
| 212.472900 | 30.18 | 41.57 | 31.19 | 68.39 | 6049 | 5 |
| 212.543732 | 34.84 | 49.61 | 28.06 | 74.42 | 6049 | 9 |
| 212.614578 | 37.20 | 56.41 | 33.15 | 88.40 | 6048 | 9 |
| 212.685410 | 42.09 | 50.08 | 28.90 | 82.17 | 6051 | 6 |
| 212.756271 | 39.31 | 46.84 | 37.82 | 85.54 | 6048 | 7 |
| 212.827087 | 37.23 | 52.99 | 31.51 | 83.11 | 6052 | 7 |
| 212.897934 | 39.20 | 55.69 | 41.22 | 91.76 | 6055 | 7 |
| 212.966690 | 43.37 | 53.21 | 32.03 | 85.87 | 5694 | 7 |
| 213.001404 | 39.75 | 83.09 | 29.41 | 96.85 | 235 | 5 |
| 213.038193 | 44.05 | 59.62 | 30.58 | 88.60 | 6049 | 5 |
| 213.109024 | 39.94 | 64.81 | 46.21 | 97.62 | 6057 | 5 |
| 213.179855 | 32.42 | 82.72 | 57.19 | 116.99 | 6058 | 7 |
| 213.250687 | 30.62 | 71.94 | 33.90 | 95.02 | 6055 | 18 |
| 213.321518 | 30.43 | 61.50 | 32.72 | 84.92 | 6059 | 18 |
| 213.392380 | 28.06 | 81.63 | 58.09 | 116.49 | 6053 | 7 |
| 213.463196 | 32.21 | 66.00 | 56.32 | 106.91 | 6054 | 7 |
| 213.534012 | 34.02 | 55.10 | 51.50 | 94.92 | 6053 | 12 |
| 213.604843 | 34.83 | 63.38 | 41.09 | 96.46 | 6052 | 12 |
| 213.675690 | 38.51 | 54.38 | 42.87 | 91.79 | 6045 | 15 |
| 213.746567 | 41.25 | 62.15 | 61.06 | 110.27 | 6046 | 15 |
| 213.817398 | 39.45 | 67.43 | 60.48 | 112.95 | 6053 | 56 |
| 213.888214 | 38.44 | 54.76 | 64.04 | 105.53 | 6050 | 48 |
| 213.958984 | 41.82 | 80.76 | 51.74 | 120.02 | 6035 | 48 |
| 213.997208 | 23.72 | 65.50 | 12.81 | 73.81 | 473 | 48 |
| 214.031937 | 42.65 | 57.68 | 42.15 | 96.03 | 5451 | 9 |
| 214.099319 | 40.18 | 70.02 | 46.88 | 103.68 | 6030 | 9 |
| 214.170151 | 37.65 | 67.38 | 50.93 | 102.50 | 6058 | 7 |
| 214.240677 | 35.26 | 59.03 | 36.57 | 87.06 | 5993 | 7 |
| 214.311798 | 34.49 | 56.27 | 30.39 | 82.10 | 6046 | 6 |
| 214.382645 | 29.87 | 49.16 | 33.99 | 75.62 | 6052 | 9 |
| 214.453476 | 28.75 | 55.31 | 43.74 | 86.77 | 6054 | 9 |
| 214.524307 | 29.71 | 50.84 | 47.45 | 84.77 | 6051 | 7 |
| 214.595123 | 32.77 | 51.50 | 54.18 | 94.41 | 6057 | 7 |
| 214.665955 | 34.44 | 54.26 | 47.52 | 95.00 | 6045 | 22 |
| 214.736938 | 40.24 | 72.50 | 57.59 | 117.63 | 6023 | 22 |
| 214.807663 | 34.65 | 64.14 | 49.00 | 103.96 | 6051 | 15 |
| 214.878494 | 31.71 | 52.35 | 55.36 | 95.01 | 6049 | 18 |
| 214.949387 | 40.19 | 69.09 | 61.28 | 113.42 | 6047 | 18 |
| 214.992355 | 31.66 | 110.57 | 40.52 | 133.66 | 1307 | 18 |
| 215.027100 | 45.81 | 60.10 | 42.91 | 100.27 | 4620 | 18 |
| 215.089554 | 40.32 | 66.68 | 49.49 | 103.35 | 6049 | 18 |
| 215.160416 | 36.11 | 112.65 | 75.73 | 153.32 | 6060 | 15 |
| 215.231232 | 33.25 | 86.94 | 44.11 | 114.47 | 6057 | 15 |
| 215.302078 | 35.60 | 51.37 | 26.45 | 75.24 | 6061 | 7 |
| 215.372925 | 29.10 | 44.66 | 27.85 | 67.64 | 6055 | 7 |
| 215.443771 | 28.08 | 59.47 | 44.63 | 88.85 | 6051 | 6 |
| 215.514572 | 29.52 | 47.38 | 43.33 | 81.55 | 6045 | 5 |
| 215.585403 | 32.85 | 46.65 | 22.15 | 68.73 | 6055 | 5 |
| 215.656219 | 32.58 | 47.29 | 29.51 | 73.12 | 6051 | 9 |
| 215.727097 | 37.61 | 47.30 | 46.79 | 93.05 | 6051 | 9 |
| 215.797943 | 35.93 | 59.30 | 43.94 | 96.83 | 6045 | 15 |
| 215.868790 | 31.70 | 66.13 | 45.79 | 100.03 | 6051 | 15 |

| | | | | | | |
|------------|--------|--------|-------|--------|------|----|
| 215.939651 | 34.98 | 53.34 | 37.77 | 86.04 | 6049 | 9 |
| 215.987503 | 35.09 | 70.95 | 62.36 | 111.10 | 2135 | 9 |
| 216.021912 | 43.75 | 55.26 | 52.16 | 100.76 | 3735 | 9 |
| 216.079163 | 41.80 | 65.37 | 38.26 | 96.05 | 6054 | 9 |
| 216.150024 | 33.25 | 80.13 | 47.96 | 109.29 | 6050 | 9 |
| 216.220840 | 33.49 | 54.42 | 30.01 | 77.78 | 6056 | 9 |
| 216.291672 | 31.59 | 46.41 | 22.40 | 66.56 | 6060 | 7 |
| 216.362503 | 28.38 | 55.51 | 32.26 | 77.40 | 6058 | 7 |
| 216.433350 | 26.12 | 62.84 | 44.59 | 91.84 | 6048 | 9 |
| 216.504150 | 28.47 | 45.35 | 30.56 | 69.49 | 6052 | 7 |
| 216.574982 | 32.62 | 46.23 | 30.84 | 74.51 | 6045 | 7 |
| 216.645798 | 31.99 | 50.43 | 29.90 | 75.18 | 6050 | 12 |
| 216.716660 | 34.52 | 47.57 | 46.38 | 90.68 | 6033 | 12 |
| 216.787552 | 34.59 | 50.54 | 43.31 | 88.27 | 6045 | 12 |
| 216.858368 | 29.53 | 58.48 | 39.59 | 88.01 | 6051 | 12 |
| 216.929184 | 34.14 | 58.09 | 35.33 | 86.27 | 6053 | 7 |
| 216.982269 | 31.07 | 45.63 | 55.90 | 90.40 | 3020 | 7 |
| 217.017044 | 44.32 | 77.25 | 30.49 | 102.32 | 2908 | 18 |
| 217.069489 | 40.84 | 73.37 | 66.32 | 121.76 | 6038 | 18 |
| 217.140274 | 32.98 | 93.67 | 62.73 | 133.40 | 6062 | 15 |
| 217.211105 | 33.56 | 76.81 | 44.36 | 106.48 | 6056 | 15 |
| 217.281967 | 34.32 | 70.17 | 41.36 | 99.35 | 6050 | 18 |
| 217.352783 | 28.57 | 56.41 | 37.45 | 85.10 | 6060 | 18 |
| 217.423615 | 28.73 | 57.00 | 43.54 | 88.64 | 6059 | 18 |
| 217.494507 | 33.81 | 44.12 | 27.45 | 71.23 | 6039 | 18 |
| 217.565262 | 38.15 | 68.86 | 54.56 | 111.59 | 6053 | 15 |
| 217.636093 | 35.95 | 60.70 | 49.87 | 99.22 | 6053 | 22 |
| 217.706970 | 38.14 | 59.73 | 53.82 | 104.92 | 6051 | 22 |
| 217.777802 | 40.60 | 75.94 | 49.11 | 114.20 | 6053 | 18 |
| 217.848648 | 32.60 | 55.79 | 34.39 | 85.75 | 6047 | 18 |
| 217.919464 | 35.38 | 60.58 | 39.54 | 91.58 | 6057 | 12 |
| 217.977417 | 34.29 | 76.76 | 50.03 | 110.24 | 3850 | 12 |
| 218.012161 | 49.25 | 56.19 | 38.91 | 93.21 | 2080 | 9 |
| 218.059723 | 36.87 | 65.95 | 35.41 | 94.75 | 6041 | 9 |
| 218.130554 | 29.78 | 63.44 | 38.01 | 90.06 | 6052 | 15 |
| 218.201431 | 111.03 | 70.32 | 59.80 | 164.94 | 6003 | 15 |
| 218.272263 | 29.82 | 67.67 | 42.38 | 96.27 | 6052 | 48 |
| 218.343063 | 30.72 | 70.61 | 62.66 | 113.07 | 6060 | 48 |
| 218.413895 | 25.37 | 71.63 | 52.21 | 103.65 | 6051 | 39 |
| 218.484711 | 29.03 | 49.99 | 42.97 | 82.47 | 6049 | 39 |
| 218.555527 | 34.00 | 67.97 | 55.12 | 110.07 | 6051 | 18 |
| 218.626358 | 31.36 | 70.52 | 66.99 | 119.70 | 6047 | 27 |
| 218.697235 | 34.51 | 69.72 | 74.04 | 124.94 | 6054 | 27 |
| 218.768066 | 32.06 | 65.10 | 37.78 | 95.16 | 6051 | 15 |
| 218.838913 | 28.93 | 57.51 | 49.05 | 92.49 | 6056 | 15 |
| 218.909744 | 35.39 | 53.02 | 50.87 | 93.21 | 6060 | 27 |
| 218.972565 | 47.35 | 76.80 | 65.20 | 126.34 | 4683 | 27 |
| 219.007309 | 35.78 | 59.18 | 57.51 | 98.46 | 1248 | 27 |
| 219.050018 | 43.31 | 81.49 | 64.52 | 128.30 | 6046 | 27 |
| 219.120850 | 43.96 | 99.40 | 81.54 | 154.68 | 6030 | 27 |
| 219.191742 | 36.50 | 108.04 | 67.05 | 145.22 | 5827 | 32 |
| 219.262482 | 40.97 | 60.09 | 32.23 | 87.01 | 6059 | 9 |
| 219.333282 | 34.01 | 44.96 | 25.74 | 69.40 | 6041 | 9 |
| 219.404160 | 29.89 | 52.22 | 38.95 | 79.91 | 6057 | 9 |
| 219.475006 | 29.30 | 49.66 | 42.35 | 79.57 | 6054 | 9 |
| 219.545837 | 32.71 | 55.55 | 33.33 | 81.04 | 6047 | 15 |
| 219.616638 | 33.50 | 59.36 | 41.45 | 90.53 | 6053 | 15 |
| 219.687531 | 30.36 | 53.72 | 34.70 | 83.08 | 6048 | 12 |
| 219.758347 | 31.75 | 58.38 | 39.34 | 89.65 | 6052 | 9 |
| 219.829178 | 30.66 | 57.18 | 39.26 | 86.20 | 6057 | 9 |
| 219.900024 | 33.45 | 62.49 | 51.34 | 98.89 | 6058 | 18 |
| 219.967728 | 36.85 | 58.01 | 37.77 | 87.25 | 5516 | 18 |
| 220.002441 | 45.57 | 85.83 | 21.85 | 100.08 | 414 | 5 |
| 220.040283 | 39.67 | 60.89 | 38.49 | 90.58 | 6052 | 5 |
| 220.111115 | 36.81 | 62.58 | 35.43 | 89.46 | 6055 | 5 |
| 220.181931 | 37.32 | 51.68 | 29.05 | 77.19 | 6042 | 4 |
| 220.252762 | 35.62 | 54.46 | 29.73 | 78.14 | 6056 | 6 |
| 220.323593 | 31.13 | 51.58 | 26.08 | 74.57 | 6055 | 6 |
| 220.394440 | 27.72 | 58.78 | 41.40 | 86.41 | 6054 | 12 |
| 220.465485 | 28.66 | 61.98 | 63.70 | 109.09 | 5938 | 12 |
| 220.536118 | 29.45 | 45.89 | 40.24 | 78.25 | 6051 | 12 |

| | | | | | | |
|------------|--------|--------|--------|--------|------|-----|
| 220.606949 | 32.88 | 49.37 | 23.83 | 71.32 | 6055 | 12 |
| 220.677765 | 31.83 | 52.71 | 26.54 | 75.58 | 6045 | 5 |
| 220.748627 | 30.24 | 55.57 | 41.94 | 85.82 | 6049 | 5 |
| 220.819458 | 31.15 | 50.89 | 34.79 | 78.97 | 6058 | 7 |
| 220.890305 | 33.11 | 51.10 | 42.92 | 83.94 | 6059 | 7 |
| 220.961121 | 39.91 | 54.24 | 38.19 | 86.44 | 6055 | 7 |
| 220.998245 | 22.97 | 67.25 | 11.90 | 73.19 | 294 | 7 |
| 221.032639 | 41.65 | 61.03 | 42.31 | 95.16 | 5564 | 6 |
| 221.100677 | 42.62 | 60.03 | 35.82 | 90.57 | 6055 | 6 |
| 221.171539 | 38.38 | 50.64 | 32.07 | 79.15 | 6062 | 5 |
| 221.242355 | 39.27 | 44.20 | 27.23 | 71.03 | 6059 | 5 |
| 221.313187 | 35.26 | 57.43 | 29.64 | 82.28 | 6061 | 7 |
| 221.384033 | 30.22 | 40.39 | 29.88 | 66.49 | 6061 | 5 |
| 221.454865 | 27.37 | 44.41 | 24.50 | 64.18 | 6058 | 5 |
| 221.525681 | 31.10 | 58.51 | 33.71 | 82.72 | 6049 | 9 |
| 221.596512 | 31.25 | 51.67 | 28.33 | 74.46 | 6057 | 9 |
| 221.667419 | 30.04 | 46.77 | 44.58 | 82.69 | 6040 | 6 |
| 221.738251 | 25.78 | 41.67 | 34.31 | 69.44 | 6038 | 6 |
| 221.809052 | 30.15 | 56.80 | 36.24 | 82.99 | 6052 | 7 |
| 221.879883 | 31.20 | 52.89 | 38.27 | 81.64 | 6059 | 7 |
| 221.950714 | 37.48 | 51.50 | 34.19 | 80.34 | 6058 | 7 |
| 221.993057 | 30.56 | 60.51 | 51.88 | 93.33 | 1184 | 7 |
| 222.027802 | 42.56 | 63.69 | 46.68 | 101.09 | 4743 | 6 |
| 222.090973 | 39.29 | 65.04 | 37.43 | 94.62 | 6057 | 6 |
| 222.161789 | 38.22 | 60.90 | 30.65 | 85.81 | 6042 | 6 |
| 222.232620 | 39.17 | 45.56 | 25.13 | 70.34 | 6055 | 6 |
| 222.303467 | 37.51 | 50.63 | 21.08 | 72.99 | 6064 | 4 |
| 222.374313 | 30.53 | 40.89 | 32.86 | 68.95 | 6059 | 4 |
| 222.445145 | 28.11 | 45.27 | 28.39 | 67.56 | 6055 | 4 |
| 222.515945 | 30.26 | 45.87 | 30.42 | 70.67 | 6047 | 4 |
| 222.586777 | 34.26 | 51.38 | 25.30 | 74.34 | 6056 | 4 |
| 222.657669 | 31.55 | 45.36 | 25.93 | 69.37 | 6042 | 4 |
| 222.728546 | 28.07 | 41.76 | 40.75 | 74.86 | 6039 | 4 |
| 222.799332 | 28.62 | 45.33 | 37.31 | 75.18 | 6050 | 4 |
| 222.870178 | 29.70 | 53.42 | 43.02 | 84.54 | 6058 | 4 |
| 222.941010 | 33.58 | 64.07 | 36.30 | 89.16 | 6054 | 9 |
| 222.988190 | 43.03 | 59.53 | 59.42 | 103.74 | 2013 | 9 |
| 223.022934 | 31.78 | 52.42 | 18.39 | 70.99 | 3896 | 4 |
| 223.081253 | 39.17 | 57.51 | 35.97 | 87.82 | 6055 | 4 |
| 223.141571 | 42.66 | 61.69 | 47.61 | 98.57 | 4140 | 12 |
| 223.222916 | 35.61 | 69.75 | 49.65 | 102.48 | 6051 | 12 |
| 223.293869 | 37.10 | 98.99 | 73.40 | 142.41 | 5986 | 39 |
| 223.364609 | 29.60 | 77.13 | 55.23 | 110.34 | 6054 | 39 |
| 223.435425 | 25.66 | 93.29 | 65.17 | 128.33 | 6054 | 27 |
| 223.506256 | 30.53 | 54.41 | 70.09 | 108.29 | 6043 | 32 |
| 223.577072 | 31.72 | 67.92 | 55.38 | 104.95 | 6050 | 32 |
| 223.647888 | 30.50 | 59.73 | 55.17 | 100.05 | 6037 | 15 |
| 223.718735 | 31.81 | 63.30 | 63.67 | 110.71 | 6042 | 15 |
| 223.789612 | 28.65 | 61.31 | 53.77 | 101.32 | 6052 | 18 |
| 223.860458 | 29.86 | 65.23 | 61.24 | 108.21 | 6053 | 18 |
| 223.931290 | 44.01 | 88.16 | 69.76 | 144.20 | 6058 | 56 |
| 223.983322 | 52.61 | 111.93 | 77.60 | 167.68 | 2843 | 56 |
| 224.018082 | 45.62 | 66.13 | 68.48 | 123.58 | 3079 | 67 |
| 224.071533 | 52.29 | 105.91 | 65.38 | 156.07 | 6046 | 67 |
| 224.142380 | 109.29 | 128.13 | 79.63 | 229.62 | 6057 | 67 |
| 224.213257 | 51.54 | 179.80 | 118.19 | 235.85 | 6045 | 67 |
| 224.284012 | 45.45 | 114.97 | 90.44 | 175.26 | 6056 | 48 |
| 224.354813 | 35.81 | 108.55 | 75.13 | 153.56 | 6052 | 48 |
| 224.425690 | 34.03 | 86.72 | 72.55 | 132.18 | 6055 | 32 |
| 224.496552 | 34.97 | 92.35 | 85.26 | 151.10 | 6050 | 32 |
| 224.567352 | 38.10 | 76.09 | 72.22 | 133.54 | 6051 | 32 |
| 224.638199 | 37.30 | 72.63 | 73.90 | 131.11 | 6056 | 12 |
| 224.709106 | 38.28 | 66.84 | 52.28 | 112.07 | 6039 | 12 |
| 224.779892 | 40.45 | 88.67 | 58.72 | 128.11 | 6052 | 48 |
| 224.850739 | 37.99 | 99.87 | 70.54 | 148.35 | 6052 | 48 |
| 224.921600 | 40.51 | 101.09 | 79.20 | 155.23 | 6037 | 67 |
| 224.978470 | 32.51 | 93.22 | 78.16 | 138.97 | 3665 | 67 |
| 225.013184 | 50.32 | 89.26 | 43.19 | 123.17 | 2256 | 48 |
| 225.061813 | 36.90 | 77.82 | 52.03 | 113.31 | 6053 | 48 |
| 225.132553 | 52.99 | 167.33 | 195.15 | 282.72 | 5983 | 154 |
| 225.203522 | 40.05 | 140.67 | 110.54 | 201.42 | 6025 | 154 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|-----|
| 225.274323 | 60.85 | 216.16 | 174.85 | 309.82 | 5995 | 179 |
| 225.345108 | 80.96 | 229.42 | 174.24 | 330.58 | 6038 | 179 |
| 225.416031 | 68.80 | 197.88 | 155.01 | 289.38 | 6026 | 179 |
| 225.486832 | 63.43 | 154.36 | 129.64 | 244.81 | 6029 | 179 |
| 225.557877 | 62.09 | 148.95 | 135.94 | 250.82 | 5965 | 154 |
| 225.628479 | 62.27 | 147.50 | 154.47 | 260.21 | 6048 | 154 |
| 225.699371 | 61.97 | 155.64 | 104.07 | 232.09 | 6030 | 154 |
| 225.770187 | 59.56 | 122.86 | 89.64 | 191.32 | 6044 | 94 |
| 225.841049 | 44.42 | 130.14 | 78.79 | 180.20 | 6043 | 94 |
| 225.911880 | 54.08 | 102.53 | 66.44 | 154.79 | 6045 | 22 |
| 225.973602 | 61.98 | 84.57 | 72.41 | 152.60 | 4501 | 22 |
| 226.007996 | 37.59 | 84.17 | 32.94 | 105.37 | 1367 | 32 |
| 226.051407 | 52.64 | 77.82 | 44.02 | 117.69 | 6051 | 32 |
| 226.122238 | 55.07 | 76.30 | 50.42 | 119.45 | 6055 | 32 |
| 226.193130 | 47.13 | 72.99 | 36.24 | 103.40 | 6030 | 67 |
| 226.263931 | 47.63 | 60.03 | 30.98 | 90.96 | 6047 | 15 |
| 226.334763 | 41.17 | 50.67 | 26.61 | 81.48 | 6050 | 15 |
| 226.405563 | 38.36 | 48.06 | 28.47 | 78.40 | 6049 | 6 |
| 226.476379 | 37.59 | 50.52 | 28.50 | 79.75 | 6047 | 6 |
| 226.547195 | 40.40 | 56.35 | 27.26 | 85.44 | 6050 | 9 |
| 226.618073 | 40.92 | 61.95 | 27.43 | 90.78 | 6047 | 9 |
| 226.688904 | 42.92 | 54.98 | 29.73 | 90.13 | 6053 | 6 |
| 226.759766 | 38.77 | 48.64 | 35.54 | 85.65 | 6047 | 6 |
| 226.830597 | 40.95 | 50.00 | 35.04 | 86.50 | 6056 | 6 |
| 226.901413 | 46.37 | 51.83 | 38.53 | 92.06 | 6061 | 12 |
| 226.968430 | 51.38 | 50.08 | 33.50 | 90.32 | 5396 | 12 |
| 227.003143 | 52.91 | 99.98 | 38.53 | 121.15 | 531 | 3 |
| 227.041672 | 52.05 | 58.07 | 46.66 | 104.10 | 6052 | 3 |
| 227.112473 | 50.51 | 57.88 | 46.66 | 101.17 | 6035 | 3 |
| 227.254242 | 49.00 | 42.01 | 42.82 | 87.70 | 6039 | 3 |
| 227.324997 | 43.39 | 42.44 | 43.17 | 85.22 | 6045 | 3 |
| 227.395844 | 38.04 | 44.74 | 45.59 | 86.13 | 6059 | 4 |
| 227.466660 | 34.28 | 53.29 | 49.16 | 92.08 | 6053 | 4 |
| 227.537491 | 35.99 | 58.74 | 55.50 | 100.09 | 6038 | 9 |
| 227.608337 | 36.56 | 56.77 | 53.74 | 100.34 | 6054 | 9 |
| 227.679199 | 35.61 | 49.46 | 52.96 | 95.44 | 6052 | 18 |
| 227.750076 | 31.33 | 46.76 | 65.95 | 102.01 | 6041 | 22 |
| 227.820862 | 38.57 | 62.40 | 60.69 | 108.43 | 6049 | 22 |
| 227.891724 | 40.34 | 49.80 | 60.87 | 102.75 | 6053 | 32 |
| 227.962067 | 47.41 | 58.41 | 67.11 | 117.17 | 5965 | 32 |
| 227.998978 | 25.88 | 104.03 | 24.70 | 111.34 | 115 | 32 |
| 228.032562 | 51.00 | 56.61 | 45.67 | 102.17 | 5322 | 15 |
| 228.103180 | 49.96 | 70.52 | 42.24 | 106.14 | 4815 | 15 |
| 228.173599 | 54.50 | 65.42 | 48.30 | 108.78 | 6049 | 22 |
| 228.244415 | 54.71 | 51.80 | 27.49 | 87.17 | 6057 | 22 |
| 228.315262 | 50.10 | 49.34 | 22.61 | 80.95 | 6060 | 4 |
| 228.386108 | 45.72 | 58.90 | 36.85 | 92.88 | 6058 | 6 |
| 228.456940 | 42.87 | 58.83 | 46.95 | 98.74 | 6054 | 6 |
| 228.527771 | 42.65 | 51.03 | 35.35 | 85.87 | 6049 | 5 |
| 228.598587 | 41.87 | 59.01 | 23.08 | 86.62 | 6057 | 5 |
| 228.669403 | 43.31 | 52.47 | 27.55 | 82.87 | 6042 | 5 |
| 228.740280 | 34.73 | 40.08 | 33.64 | 72.63 | 6047 | 5 |
| 228.811127 | 38.00 | 43.64 | 35.17 | 77.63 | 6056 | 6 |
| 228.882004 | 44.36 | 44.33 | 37.19 | 82.73 | 6050 | 5 |
| 228.952789 | 50.98 | 47.71 | 32.58 | 86.03 | 6059 | 5 |
| 228.994080 | 41.37 | 49.10 | 40.14 | 84.62 | 1009 | 5 |
| 229.028824 | 57.78 | 55.56 | 43.89 | 101.71 | 4920 | 7 |
| 229.093048 | 57.03 | 61.69 | 45.47 | 105.54 | 6058 | 7 |
| 229.163910 | 51.19 | 54.87 | 34.29 | 90.94 | 6047 | 7 |
| 229.234711 | 51.90 | 57.63 | 31.61 | 93.23 | 6047 | 7 |
| 229.305557 | 49.81 | 49.92 | 21.44 | 81.89 | 6063 | 9 |
| 229.376373 | 42.35 | 64.29 | 38.46 | 94.78 | 6054 | 5 |
| 229.447220 | 41.27 | 54.87 | 42.05 | 91.43 | 6063 | 5 |
| 229.518082 | 40.33 | 63.47 | 45.09 | 100.51 | 6042 | 7 |
| 229.588867 | 36.12 | 58.73 | 45.25 | 94.17 | 6057 | 7 |
| 229.659714 | 40.44 | 49.23 | 25.94 | 79.22 | 6048 | 5 |
| 229.730560 | 32.98 | 42.20 | 29.10 | 69.71 | 6054 | 5 |
| 229.801407 | 34.08 | 42.41 | 39.95 | 76.97 | 6055 | 6 |
| 229.872238 | 39.58 | 40.75 | 37.92 | 77.13 | 6058 | 6 |
| 229.943085 | 49.26 | 47.10 | 34.87 | 86.15 | 6058 | 7 |
| 229.989243 | 58.32 | 56.24 | 55.65 | 108.39 | 1844 | 7 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 230.023651 | 46.65 | 45.52 | 29.65 | 80.46 | 4031 | 7 |
| 230.082611 | 54.89 | 58.64 | 36.55 | 97.06 | 6054 | 7 |
| 230.140991 | 53.89 | 61.08 | 46.03 | 102.69 | 3928 | 12 |
| 230.295349 | 48.90 | 73.02 | 45.30 | 112.89 | 6026 | 6 |
| 230.365967 | 41.93 | 53.17 | 37.33 | 88.94 | 6062 | 6 |
| 230.436813 | 38.96 | 50.80 | 33.25 | 82.74 | 6059 | 7 |
| 230.507614 | 39.30 | 48.58 | 34.35 | 82.33 | 6050 | 6 |
| 230.578445 | 38.92 | 53.27 | 24.80 | 81.06 | 6056 | 6 |
| 230.649277 | 38.59 | 41.17 | 44.56 | 82.04 | 6058 | 4 |
| 230.720154 | 35.75 | 51.13 | 70.79 | 103.50 | 6047 | 4 |
| 230.790970 | 37.98 | 52.74 | 64.32 | 99.95 | 6049 | 5 |
| 230.861893 | 36.36 | 46.69 | 51.57 | 87.87 | 6040 | 5 |
| 230.932617 | 39.19 | 43.16 | 42.17 | 81.10 | 6039 | 5 |
| 230.984009 | 52.12 | 44.38 | 14.71 | 76.34 | 2726 | 5 |
| 231.018768 | 32.67 | 49.78 | 38.97 | 80.98 | 3205 | 6 |
| 231.072906 | 43.30 | 57.33 | 27.01 | 85.59 | 6055 | 6 |
| 231.143753 | 42.66 | 50.37 | 33.55 | 83.10 | 6063 | 5 |
| 231.214584 | 41.10 | 38.96 | 32.61 | 74.55 | 6051 | 5 |
| 231.285416 | 42.54 | 36.25 | 26.43 | 71.35 | 6064 | 2 |
| 231.356247 | 34.15 | 35.01 | 21.68 | 63.37 | 6060 | 2 |
| 231.427078 | 29.81 | 38.47 | 20.12 | 61.00 | 6054 | 2 |
| 231.497894 | 31.79 | 39.00 | 20.46 | 61.90 | 6052 | 2 |
| 231.568726 | 35.69 | 44.25 | 18.12 | 66.72 | 6055 | 2 |
| 231.639557 | 35.59 | 48.65 | 20.10 | 70.86 | 6051 | 3 |
| 231.710434 | 35.61 | 41.10 | 28.16 | 69.88 | 6056 | 3 |
| 231.781250 | 36.76 | 42.00 | 33.47 | 72.52 | 6048 | 3 |
| 231.852158 | 35.11 | 41.16 | 37.72 | 74.86 | 6046 | 3 |
| 231.922943 | 37.99 | 43.32 | 35.73 | 76.03 | 6060 | 3 |
| 231.979111 | 41.65 | 48.33 | 20.72 | 75.59 | 3544 | 3 |
| 232.013870 | 37.08 | 47.71 | 48.70 | 82.85 | 2374 | 4 |
| 232.063187 | 40.94 | 52.99 | 37.12 | 87.19 | 6053 | 4 |
| 232.133942 | 41.08 | 56.69 | 30.75 | 86.18 | 5980 | 2 |
| 232.204819 | 39.82 | 39.38 | 31.10 | 73.49 | 6049 | 2 |
| 232.275696 | 42.85 | 36.95 | 28.54 | 71.70 | 6064 | 2 |
| 232.346512 | 34.24 | 38.65 | 23.50 | 65.57 | 6044 | 2 |
| 232.417374 | 28.26 | 43.71 | 22.63 | 65.24 | 6056 | 3 |
| 232.488190 | 30.89 | 38.14 | 15.46 | 58.28 | 6049 | 3 |
| 232.559006 | 33.34 | 44.06 | 15.39 | 63.49 | 6051 | 4 |
| 232.629837 | 35.74 | 47.56 | 18.56 | 70.31 | 6055 | 9 |
| 232.700699 | 34.50 | 47.80 | 31.15 | 75.38 | 6054 | 9 |
| 232.771545 | 33.85 | 45.61 | 42.56 | 77.89 | 6051 | 5 |
| 232.842377 | 33.86 | 45.23 | 43.89 | 79.18 | 6056 | 5 |
| 232.913208 | 36.96 | 45.68 | 37.83 | 78.54 | 6051 | 4 |
| 232.974289 | 42.77 | 57.79 | 35.81 | 90.17 | 4386 | 4 |
| 233.009033 | 33.13 | 32.78 | 30.44 | 59.82 | 1546 | 0 |
| 233.053467 | 40.81 | 51.19 | 42.62 | 86.17 | 6050 | 0 |
| 233.124313 | 43.30 | 53.07 | 36.66 | 88.37 | 6060 | 0 |
| 233.195145 | 39.34 | 36.32 | 35.02 | 72.43 | 6057 | 2 |
| 233.265961 | 43.21 | 35.00 | 25.80 | 69.40 | 6062 | 0 |
| 233.336792 | 34.50 | 34.25 | 19.51 | 61.80 | 6056 | 0 |
| 233.407623 | 28.84 | 34.38 | 19.35 | 57.24 | 6056 | 6 |
| 233.478455 | 29.25 | 40.80 | 23.43 | 63.42 | 6051 | 6 |
| 233.549301 | 34.43 | 41.57 | 17.70 | 64.32 | 6053 | 3 |
| 233.620117 | 34.87 | 48.62 | 21.39 | 70.30 | 6053 | 3 |
| 233.690979 | 34.19 | 49.17 | 38.35 | 79.20 | 6051 | 9 |
| 233.761826 | 32.45 | 45.52 | 47.43 | 80.57 | 6050 | 7 |
| 233.832657 | 32.91 | 44.52 | 37.31 | 74.26 | 6054 | 7 |
| 233.903488 | 36.29 | 45.66 | 48.31 | 85.55 | 6053 | 4 |
| 233.969452 | 39.13 | 53.97 | 47.01 | 92.07 | 5221 | 4 |
| 234.004166 | 50.09 | 62.32 | 36.03 | 89.55 | 712 | 7 |
| 234.043747 | 38.38 | 57.15 | 41.02 | 90.44 | 6048 | 7 |
| 234.114594 | 39.85 | 59.38 | 50.18 | 101.28 | 6041 | 7 |
| 234.185379 | 35.99 | 91.11 | 65.30 | 129.41 | 6039 | 18 |
| 234.256256 | 40.97 | 62.91 | 53.38 | 104.39 | 6047 | 6 |
| 234.327087 | 35.14 | 50.72 | 46.62 | 90.63 | 6062 | 6 |
| 234.397919 | 30.57 | 48.84 | 44.07 | 86.36 | 6051 | 12 |
| 234.468750 | 32.83 | 50.89 | 52.90 | 92.24 | 6053 | 12 |
| 234.539566 | 32.08 | 48.81 | 48.54 | 90.04 | 6053 | 6 |
| 234.610413 | 31.43 | 60.70 | 44.96 | 95.61 | 6050 | 6 |
| 234.681213 | 34.10 | 62.49 | 41.97 | 93.08 | 6043 | 6 |
| 234.752121 | 31.23 | 59.24 | 46.88 | 95.98 | 6047 | 7 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 234.822922 | 33.34 | 57.97 | 47.29 | 97.24 | 6056 | 7 |
| 234.893753 | 41.01 | 60.94 | 59.86 | 107.98 | 6051 | 22 |
| 234.964600 | 43.84 | 63.40 | 51.53 | 104.00 | 6059 | 22 |
| 235.034393 | 44.08 | 60.62 | 38.34 | 94.23 | 5873 | 5 |
| 235.104156 | 44.58 | 67.38 | 34.80 | 96.02 | 6057 | 5 |
| 235.174988 | 42.84 | 57.25 | 29.27 | 83.88 | 6062 | 5 |
| 235.245804 | 44.18 | 51.81 | 30.45 | 80.93 | 6059 | 5 |
| 235.316666 | 38.08 | 39.91 | 20.12 | 65.35 | 6057 | 3 |
| 235.387497 | 30.90 | 38.25 | 22.29 | 61.47 | 6059 | 0 |
| 235.458328 | 28.93 | 39.82 | 21.59 | 61.12 | 6058 | 0 |
| 235.529160 | 31.80 | 45.89 | 24.17 | 69.19 | 6049 | 2 |
| 235.599991 | 33.93 | 50.26 | 23.25 | 72.79 | 6057 | 2 |
| 235.670853 | 30.70 | 45.20 | 21.71 | 66.38 | 6046 | 2 |
| 235.741730 | 29.15 | 42.74 | 29.20 | 67.12 | 6039 | 2 |
| 235.812531 | 30.27 | 42.71 | 28.80 | 67.26 | 6053 | 0 |
| 235.883362 | 32.42 | 45.28 | 33.72 | 72.93 | 6060 | 3 |
| 235.954163 | 38.41 | 47.57 | 28.70 | 76.30 | 6044 | 3 |
| 235.994766 | 22.82 | 47.97 | 23.37 | 62.12 | 888 | 3 |
| 236.029541 | 42.01 | 49.62 | 38.84 | 86.77 | 5044 | 2 |
| 236.094437 | 39.77 | 51.61 | 43.89 | 89.22 | 6055 | 2 |
| 236.165283 | 38.53 | 50.95 | 39.89 | 83.24 | 6043 | 0 |
| 236.236099 | 42.86 | 40.95 | 41.85 | 81.66 | 6059 | 0 |
| 236.306961 | 34.59 | 40.98 | 41.02 | 76.06 | 6054 | 3 |
| 236.377792 | 27.53 | 51.82 | 64.73 | 97.37 | 6055 | 7 |
| 236.448639 | 30.26 | 63.57 | 67.78 | 111.11 | 6050 | 7 |
| 236.519440 | 30.09 | 67.93 | 87.33 | 128.79 | 6050 | 9 |
| 236.590271 | 28.95 | 63.42 | 65.36 | 110.16 | 6052 | 9 |
| 236.661102 | 29.92 | 56.03 | 61.42 | 99.29 | 6053 | 18 |
| 236.807220 | 37.79 | 53.89 | 54.56 | 98.20 | 5299 | 9 |
| 236.873657 | 34.48 | 51.71 | 56.05 | 97.37 | 6055 | 9 |
| 236.944458 | 38.43 | 48.83 | 53.45 | 96.16 | 6053 | 5 |
| 236.989899 | 58.03 | 60.67 | 87.02 | 136.91 | 1697 | 5 |
| 237.024658 | 32.10 | 51.71 | 25.91 | 73.99 | 4200 | 9 |
| 237.084717 | 40.63 | 60.53 | 35.26 | 89.67 | 6047 | 9 |
| 237.155518 | 37.83 | 56.39 | 35.80 | 84.88 | 6041 | 15 |
| 237.226593 | 39.20 | 79.28 | 59.01 | 117.23 | 5970 | 15 |
| 237.297241 | 34.40 | 63.43 | 29.11 | 87.81 | 6062 | 12 |
| 237.368073 | 29.14 | 44.55 | 23.89 | 64.72 | 6060 | 12 |
| 237.438873 | 25.25 | 42.68 | 22.79 | 61.40 | 6054 | 7 |
| 237.509705 | 26.92 | 46.77 | 26.64 | 68.26 | 6051 | 6 |
| 237.580551 | 31.91 | 53.16 | 24.33 | 73.70 | 6053 | 6 |
| 237.651367 | 29.59 | 57.02 | 28.30 | 78.48 | 6051 | 5 |
| 237.722183 | 31.47 | 51.42 | 32.68 | 77.73 | 6038 | 5 |
| 237.793076 | 33.87 | 47.35 | 35.30 | 78.17 | 6055 | 4 |
| 237.863937 | 32.22 | 46.55 | 35.14 | 76.95 | 6058 | 4 |
| 237.934738 | 35.85 | 52.00 | 33.11 | 82.72 | 6054 | 3 |
| 237.985062 | 47.58 | 55.39 | 48.37 | 98.26 | 2548 | 3 |
| 238.019821 | 27.29 | 56.24 | 18.19 | 71.95 | 3376 | 0 |
| 238.074982 | 39.80 | 66.03 | 32.11 | 91.27 | 6051 | 0 |
| 238.145782 | 42.09 | 67.19 | 36.09 | 95.90 | 6055 | 4 |
| 238.216660 | 39.42 | 44.98 | 22.94 | 69.92 | 6061 | 4 |
| 238.287491 | 39.81 | 39.19 | 18.20 | 65.23 | 6060 | 2 |
| 238.358322 | 31.61 | 38.30 | 21.38 | 61.24 | 6060 | 2 |
| 238.429153 | 28.84 | 41.22 | 20.73 | 61.52 | 6051 | 2 |
| 238.500031 | 29.39 | 44.28 | 26.63 | 67.26 | 6045 | 3 |
| 238.570801 | 33.01 | 48.64 | 22.92 | 69.96 | 6048 | 3 |
| 238.641663 | 32.87 | 51.80 | 24.97 | 72.86 | 6049 | 3 |
| 238.712509 | 29.27 | 50.67 | 32.39 | 75.97 | 6047 | 3 |
| 238.783340 | 29.97 | 45.62 | 34.92 | 74.93 | 6054 | 6 |
| 238.854187 | 31.01 | 51.39 | 34.00 | 77.91 | 6054 | 6 |
| 238.925018 | 35.93 | 49.01 | 33.60 | 79.55 | 6047 | 4 |
| 238.979874 | 40.03 | 58.25 | 42.75 | 91.49 | 3213 | 4 |
| 239.014557 | 37.06 | 56.16 | 31.52 | 83.38 | 2449 | 4 |
| 239.064590 | 40.02 | 59.34 | 33.55 | 88.52 | 6053 | 4 |
| 239.135422 | 38.78 | 61.49 | 28.70 | 86.82 | 6052 | 5 |
| 239.206238 | 38.64 | 60.47 | 31.25 | 86.25 | 6049 | 5 |
| 239.277069 | 39.15 | 63.50 | 36.52 | 90.77 | 6060 | 6 |
| 239.347916 | 29.36 | 68.54 | 42.73 | 96.18 | 6059 | 6 |
| 239.418732 | 27.18 | 47.94 | 32.93 | 72.55 | 6047 | 5 |
| 239.489578 | 29.15 | 51.54 | 33.07 | 76.17 | 6051 | 5 |
| 239.560394 | 30.53 | 49.08 | 35.60 | 78.65 | 6050 | 6 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 239.631256 | 31.63 | 47.17 | 28.46 | 71.51 | 6054 | 5 |
| 239.702103 | 29.52 | 49.17 | 25.32 | 71.59 | 6050 | 5 |
| 239.772919 | 28.90 | 43.27 | 31.13 | 69.66 | 6051 | 3 |
| 239.843765 | 30.72 | 43.70 | 28.69 | 68.61 | 6053 | 3 |
| 239.914612 | 35.32 | 45.38 | 32.30 | 74.44 | 6060 | 3 |
| 239.974991 | 42.87 | 55.66 | 42.78 | 92.04 | 4261 | 3 |
| 240.009735 | 31.90 | 32.69 | 16.93 | 54.08 | 1664 | 7 |
| 240.054855 | 40.55 | 61.28 | 41.49 | 94.31 | 6053 | 7 |
| 240.125671 | 43.97 | 58.09 | 29.99 | 87.68 | 6050 | 4 |
| 240.196533 | 39.72 | 49.85 | 26.35 | 75.61 | 6063 | 4 |
| 240.267365 | 41.77 | 44.93 | 19.97 | 69.69 | 6064 | 3 |
| 240.338135 | 34.62 | 42.10 | 19.93 | 64.92 | 6048 | 3 |
| 240.409058 | 29.58 | 41.57 | 20.58 | 61.77 | 6044 | 4 |
| 240.479843 | 30.01 | 46.71 | 27.07 | 69.27 | 6055 | 4 |
| 240.550659 | 32.73 | 47.64 | 23.55 | 70.82 | 6051 | 12 |
| 240.621521 | 32.68 | 58.06 | 36.13 | 84.77 | 6053 | 12 |
| 240.692413 | 30.37 | 49.98 | 30.95 | 75.23 | 6043 | 7 |
| 240.763199 | 26.38 | 47.32 | 33.35 | 71.05 | 6053 | 7 |
| 240.834045 | 27.10 | 48.10 | 35.17 | 74.81 | 6052 | 7 |
| 240.904877 | 32.03 | 43.41 | 37.47 | 74.98 | 6058 | 9 |
| 240.970154 | 36.73 | 50.56 | 36.82 | 81.51 | 5100 | 9 |
| 241.004868 | 44.80 | 38.34 | 14.50 | 64.15 | 830 | 9 |
| 241.045105 | 39.81 | 63.57 | 40.87 | 95.79 | 6046 | 9 |
| 241.115921 | 42.87 | 57.99 | 43.73 | 96.56 | 6045 | 9 |
| 241.186798 | 38.14 | 51.92 | 29.17 | 79.17 | 6047 | 5 |
| 241.257614 | 39.34 | 52.44 | 21.81 | 74.70 | 6061 | 7 |
| 241.328476 | 31.14 | 56.85 | 23.26 | 77.41 | 6062 | 7 |
| 241.399338 | 28.09 | 56.88 | 44.49 | 86.39 | 6046 | 18 |
| 241.470123 | 27.42 | 72.16 | 64.75 | 111.74 | 6055 | 18 |
| 241.540955 | 31.53 | 60.26 | 71.05 | 113.77 | 6051 | 27 |
| 241.611801 | 34.26 | 53.28 | 32.76 | 81.33 | 6055 | 27 |
| 241.682663 | 31.43 | 52.72 | 37.62 | 83.29 | 6043 | 48 |
| 241.753479 | 35.42 | 67.28 | 79.96 | 128.62 | 6049 | 56 |
| 241.824310 | 31.18 | 58.80 | 40.52 | 88.55 | 6051 | 56 |
| 241.895172 | 35.36 | 56.93 | 62.76 | 103.77 | 6057 | 48 |
| 241.965286 | 48.09 | 69.06 | 70.02 | 124.86 | 5923 | 48 |
| 242.035477 | 55.75 | 116.87 | 85.32 | 176.28 | 6041 | 67 |
| 242.106277 | 50.06 | 88.34 | 58.66 | 132.32 | 6046 | 67 |
| 242.177109 | 42.76 | 91.69 | 82.01 | 144.31 | 6053 | 39 |
| 242.247910 | 46.59 | 99.15 | 80.32 | 151.53 | 6057 | 39 |
| 242.318756 | 40.23 | 64.85 | 30.55 | 90.85 | 6057 | 48 |
| 242.389587 | 35.77 | 58.95 | 46.45 | 92.77 | 6055 | 27 |
| 242.460419 | 34.15 | 71.24 | 43.99 | 102.18 | 6061 | 27 |
| 242.531250 | 32.80 | 56.62 | 46.76 | 92.94 | 6049 | 15 |
| 242.602081 | 35.68 | 50.35 | 27.77 | 76.92 | 6052 | 15 |
| 242.672913 | 36.80 | 67.64 | 55.65 | 107.39 | 6049 | 32 |
| 242.743744 | 29.63 | 51.56 | 54.04 | 92.50 | 6052 | 32 |
| 242.814590 | 41.32 | 71.52 | 78.65 | 131.14 | 6054 | 39 |
| 242.885452 | 38.56 | 54.60 | 49.36 | 94.14 | 6058 | 15 |
| 242.956268 | 47.26 | 53.71 | 47.23 | 97.52 | 6046 | 15 |
| 242.995819 | 23.68 | 52.04 | 25.98 | 69.66 | 711 | 15 |
| 243.030228 | 53.50 | 60.94 | 65.60 | 118.98 | 5162 | 22 |
| 243.095825 | 50.74 | 65.70 | 58.98 | 114.25 | 6054 | 22 |
| 243.166672 | 45.00 | 61.39 | 40.90 | 95.12 | 6061 | 15 |
| 243.237518 | 46.55 | 50.97 | 23.74 | 78.84 | 6046 | 15 |
| 243.308350 | 41.46 | 47.11 | 25.23 | 75.54 | 6060 | 7 |
| 243.379196 | 35.52 | 46.07 | 36.92 | 78.75 | 6045 | 12 |
| 243.450012 | 30.48 | 50.15 | 34.04 | 75.90 | 6055 | 12 |
| 243.520828 | 33.39 | 47.72 | 28.58 | 73.39 | 6048 | 9 |
| 243.591629 | 34.43 | 54.98 | 31.50 | 81.18 | 6036 | 9 |
| 243.662537 | 31.85 | 43.25 | 25.76 | 68.24 | 6040 | 9 |
| 243.733353 | 28.13 | 44.98 | 33.78 | 71.74 | 6054 | 9 |
| 243.804184 | 30.46 | 43.44 | 32.98 | 71.08 | 6055 | 7 |
| 243.875031 | 34.71 | 55.58 | 47.28 | 89.73 | 6058 | 18 |
| 243.945847 | 43.26 | 49.41 | 45.04 | 91.19 | 6056 | 18 |
| 243.990616 | 57.51 | 52.99 | 44.94 | 101.21 | 1599 | 18 |
| 244.025345 | 36.51 | 51.74 | 29.21 | 77.76 | 4321 | 18 |
| 244.086090 | 46.42 | 65.89 | 55.41 | 108.28 | 6050 | 18 |
| 244.156937 | 44.87 | 64.36 | 43.87 | 99.98 | 6060 | 12 |
| 244.227829 | 43.64 | 43.36 | 24.19 | 71.61 | 6051 | 12 |
| 244.298615 | 40.90 | 57.47 | 27.84 | 84.12 | 6064 | 9 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 244.369476 | 32.45 | 51.67 | 36.81 | 80.96 | 6055 | 9 |
| 244.440308 | 30.67 | 57.42 | 57.46 | 96.93 | 6040 | 18 |
| 244.511093 | 32.33 | 60.89 | 53.39 | 99.04 | 6047 | 15 |
| 244.581955 | 33.18 | 52.11 | 42.62 | 86.37 | 6047 | 15 |
| 244.652771 | 33.93 | 51.97 | 37.72 | 82.82 | 6053 | 12 |
| 244.723618 | 29.93 | 48.96 | 47.57 | 86.59 | 6049 | 12 |
| 244.794464 | 32.59 | 51.15 | 43.98 | 84.46 | 6050 | 7 |
| 244.865326 | 33.18 | 58.29 | 41.97 | 86.76 | 6057 | 7 |
| 244.936203 | 37.47 | 66.74 | 48.39 | 102.99 | 6034 | 18 |
| 244.985764 | 47.47 | 68.91 | 59.03 | 113.33 | 2429 | 18 |
| 245.020523 | 32.80 | 62.08 | 35.45 | 87.70 | 3500 | 18 |
| 245.076385 | 44.03 | 68.45 | 47.33 | 105.28 | 6057 | 18 |
| 245.147217 | 39.57 | 67.51 | 35.35 | 95.86 | 6063 | 12 |
| 245.218063 | 41.27 | 60.86 | 38.02 | 91.56 | 6060 | 12 |
| 245.288895 | 39.75 | 65.45 | 42.55 | 99.76 | 6058 | 22 |
| 245.359665 | 28.97 | 45.21 | 37.11 | 75.19 | 6047 | 22 |
| 245.430573 | 28.19 | 49.32 | 27.19 | 70.74 | 6060 | 18 |
| 245.501343 | 29.97 | 48.15 | 47.78 | 85.91 | 6030 | 12 |
| 245.572205 | 34.59 | 48.61 | 32.12 | 77.71 | 6056 | 12 |
| 245.643051 | 34.02 | 52.18 | 31.57 | 78.88 | 6057 | 12 |
| 245.713898 | 33.96 | 56.61 | 44.50 | 92.08 | 6051 | 12 |
| 245.784744 | 39.63 | 64.82 | 54.41 | 106.50 | 6056 | 22 |
| 245.855591 | 33.24 | 63.60 | 35.33 | 88.76 | 6047 | 22 |
| 245.926437 | 36.45 | 55.15 | 35.03 | 84.23 | 6054 | 12 |
| 245.980942 | 42.92 | 60.16 | 45.12 | 96.00 | 3249 | 12 |
| 246.015594 | 38.79 | 64.50 | 58.64 | 109.60 | 2662 | 27 |
| 246.066650 | 40.21 | 66.75 | 63.98 | 112.78 | 6052 | 27 |
| 246.137466 | 41.63 | 108.03 | 68.20 | 150.02 | 6045 | 22 |
| 246.208374 | 35.50 | 95.38 | 51.61 | 124.58 | 6048 | 22 |
| 246.279144 | 39.38 | 95.31 | 68.28 | 139.40 | 6052 | 32 |
| 246.349976 | 31.92 | 95.24 | 55.53 | 129.73 | 6053 | 32 |
| 246.420776 | 36.25 | 94.77 | 74.23 | 140.41 | 6037 | 32 |
| 246.491669 | 35.46 | 78.78 | 53.91 | 115.63 | 6046 | 32 |
| 246.562500 | 36.36 | 76.91 | 60.85 | 121.91 | 6051 | 27 |
| 246.633331 | 38.07 | 66.68 | 49.53 | 106.21 | 6055 | 27 |
| 246.704208 | 39.94 | 72.17 | 57.95 | 118.22 | 6048 | 27 |
| 246.775024 | 40.95 | 59.33 | 36.96 | 92.68 | 6053 | 9 |
| 246.845871 | 35.13 | 48.40 | 34.58 | 78.88 | 6055 | 9 |
| 246.916687 | 39.07 | 48.88 | 45.26 | 87.07 | 6049 | 9 |
| 246.976059 | 41.34 | 57.84 | 50.85 | 99.04 | 4087 | 9 |
| 247.010757 | 32.72 | 43.69 | 13.79 | 62.38 | 1842 | 3 |
| 247.056946 | 40.07 | 53.63 | 33.49 | 84.46 | 6045 | 3 |
| 247.127777 | 42.72 | 60.41 | 29.59 | 87.65 | 6064 | 7 |
| 247.198593 | 41.25 | 59.77 | 25.65 | 83.03 | 6053 | 7 |
| 247.269440 | 40.79 | 40.71 | 19.37 | 66.09 | 6061 | 3 |
| 247.340225 | 33.36 | 38.31 | 20.74 | 62.27 | 6049 | 3 |
| 247.411118 | 28.67 | 38.88 | 21.07 | 60.54 | 6057 | 3 |
| 247.481934 | 31.07 | 38.53 | 23.52 | 63.80 | 6054 | 3 |
| 247.552795 | 33.72 | 48.19 | 24.22 | 71.93 | 6035 | 5 |
| 247.623596 | 35.76 | 47.56 | 27.02 | 74.91 | 6054 | 5 |
| 247.694458 | 32.11 | 56.96 | 24.58 | 78.53 | 6053 | 6 |
| 247.765274 | 30.98 | 41.51 | 32.50 | 70.51 | 6049 | 15 |
| 247.835968 | 33.32 | 44.18 | 49.55 | 84.70 | 6026 | 15 |
| 247.908905 | 34.54 | 65.61 | 50.21 | 102.94 | 4028 | 12 |
| 247.970551 | 40.14 | 57.69 | 40.86 | 89.96 | 4734 | 12 |
| 248.005432 | 35.78 | 53.25 | 10.76 | 66.82 | 907 | 5 |
| 248.047760 | 47.96 | 54.73 | 37.97 | 91.47 | 5820 | 5 |
| 248.117340 | 51.47 | 56.63 | 34.64 | 91.61 | 6057 | 5 |
| 248.188187 | 47.95 | 45.88 | 28.61 | 79.76 | 6057 | 4 |
| 248.259018 | 48.66 | 47.54 | 22.50 | 76.47 | 6059 | 6 |
| 248.329819 | 38.89 | 55.65 | 32.12 | 85.26 | 6053 | 6 |
| 248.400681 | 34.86 | 54.59 | 40.01 | 85.23 | 6058 | 6 |
| 248.471512 | 34.66 | 40.60 | 28.02 | 70.05 | 6056 | 6 |
| 248.542389 | 50.21 | 67.95 | 27.02 | 101.08 | 6041 | 12 |
| 248.613144 | 37.92 | 55.50 | 27.37 | 80.50 | 6053 | 12 |
| 248.684021 | 32.63 | 48.83 | 27.53 | 73.34 | 6052 | 15 |
| 248.754883 | 32.74 | 65.36 | 56.40 | 105.26 | 6053 | 67 |
| 248.825729 | 39.54 | 79.30 | 78.93 | 139.77 | 6046 | 67 |
| 248.896545 | 41.90 | 77.51 | 76.01 | 135.74 | 6058 | 27 |
| 248.966003 | 45.37 | 66.14 | 57.49 | 112.16 | 5813 | 27 |
| 249.000687 | 45.14 | 121.50 | 29.75 | 133.07 | 116 | 5 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 249.036789 | 44.95 | 71.43 | 46.09 | 106.80 | 6052 | 5 |
| 249.107620 | 45.01 | 64.23 | 56.25 | 108.00 | 6057 | 5 |
| 249.178467 | 38.30 | 64.92 | 64.09 | 111.62 | 6045 | 6 |
| 249.249283 | 40.04 | 58.46 | 63.40 | 108.45 | 6060 | 6 |
| 249.320099 | 33.26 | 51.29 | 66.06 | 103.23 | 6055 | 5 |
| 249.390961 | 27.19 | 52.92 | 68.11 | 102.38 | 6059 | 4 |
| 249.461792 | 27.29 | 51.24 | 72.00 | 105.13 | 6058 | 4 |
| 249.532639 | 40.77 | 48.03 | 59.56 | 96.22 | 6052 | 5 |
| 249.603439 | 40.09 | 46.23 | 78.83 | 110.84 | 6052 | 5 |
| 249.674301 | 37.33 | 46.58 | 57.73 | 94.16 | 6052 | 9 |
| 249.745148 | 34.45 | 51.29 | 70.41 | 103.75 | 6039 | 9 |
| 249.815994 | 35.94 | 60.81 | 41.72 | 90.98 | 6050 | 15 |
| 249.886810 | 39.19 | 56.60 | 39.70 | 87.12 | 6056 | 9 |
| 249.957657 | 43.00 | 52.46 | 34.73 | 83.65 | 6058 | 9 |
| 249.996506 | 21.41 | 48.80 | 9.76 | 56.87 | 592 | 9 |
| 250.031204 | 46.17 | 56.57 | 24.17 | 85.38 | 5328 | 5 |
| 250.097900 | 47.86 | 55.17 | 26.03 | 85.64 | 6052 | 5 |
| 250.168732 | 43.84 | 42.88 | 28.63 | 75.77 | 6054 | 3 |
| 250.239563 | 46.02 | 39.79 | 31.36 | 76.39 | 6057 | 3 |
| 250.310410 | 43.13 | 37.37 | 30.30 | 73.76 | 6060 | 5 |
| 250.381256 | 35.76 | 40.69 | 30.11 | 70.85 | 6060 | 2 |
| 250.452042 | 33.13 | 37.57 | 23.76 | 64.17 | 6044 | 2 |
| 250.522888 | 34.92 | 43.15 | 21.19 | 66.53 | 6047 | 9 |
| 250.593719 | 37.83 | 47.52 | 30.70 | 78.30 | 6050 | 9 |
| 250.664566 | 35.61 | 49.90 | 29.21 | 77.64 | 6052 | 27 |
| 250.735428 | 28.78 | 56.74 | 56.23 | 95.09 | 6051 | 27 |
| 250.806259 | 28.63 | 54.25 | 48.29 | 90.52 | 6039 | 22 |
| 250.877106 | 32.10 | 51.49 | 40.16 | 81.89 | 6058 | 27 |
| 250.947922 | 41.50 | 55.96 | 38.39 | 89.56 | 6059 | 27 |
| 250.991730 | 49.68 | 74.90 | 25.82 | 99.50 | 1416 | 27 |
| 251.026398 | 38.28 | 50.58 | 43.98 | 85.64 | 4490 | 15 |
| 251.088196 | 45.89 | 68.93 | 47.85 | 107.90 | 6056 | 15 |
| 251.159012 | 44.54 | 83.18 | 57.56 | 121.81 | 6054 | 12 |
| 251.229843 | 45.81 | 59.76 | 59.11 | 106.57 | 6046 | 12 |
| 251.300690 | 43.80 | 62.33 | 53.04 | 102.16 | 6061 | 15 |
| 251.371521 | 33.77 | 59.86 | 55.68 | 100.82 | 6058 | 15 |
| 251.442368 | 33.89 | 67.76 | 45.62 | 100.60 | 6055 | 12 |
| 251.513168 | 33.78 | 61.17 | 55.95 | 101.13 | 6052 | 12 |
| 251.584000 | 36.36 | 54.73 | 53.44 | 97.24 | 6051 | 12 |
| 251.654846 | 37.74 | 49.51 | 47.40 | 92.11 | 6041 | 18 |
| 251.725677 | 33.03 | 60.10 | 55.71 | 102.41 | 6051 | 18 |
| 251.796539 | 36.01 | 55.66 | 40.30 | 87.38 | 6051 | 18 |
| 251.867386 | 36.35 | 57.62 | 48.70 | 92.75 | 6055 | 18 |
| 251.938400 | 40.04 | 57.40 | 58.13 | 107.53 | 6001 | 18 |
| 251.986786 | 53.02 | 77.27 | 68.31 | 131.35 | 2233 | 18 |
| 252.021210 | 39.63 | 60.53 | 33.23 | 90.19 | 3617 | 15 |
| 252.077759 | 43.41 | 68.21 | 36.16 | 97.45 | 6057 | 15 |
| 252.148590 | 43.69 | 57.28 | 36.87 | 89.81 | 6049 | 7 |
| 252.219437 | 44.44 | 49.87 | 38.20 | 84.95 | 6056 | 7 |
| 252.290283 | 42.59 | 49.24 | 41.29 | 87.97 | 6048 | 12 |
| 252.361130 | 34.29 | 55.85 | 56.27 | 99.24 | 6050 | 12 |
| 252.431915 | 31.42 | 82.24 | 71.42 | 128.30 | 6049 | 22 |
| 252.502762 | 30.49 | 64.83 | 49.11 | 99.03 | 6049 | 22 |
| 252.573593 | 35.93 | 61.97 | 65.80 | 112.24 | 6057 | 22 |
| 252.644409 | 33.65 | 54.59 | 40.72 | 87.99 | 6050 | 22 |
| 252.715302 | 29.33 | 54.60 | 45.38 | 87.95 | 6045 | 22 |
| 252.786118 | 32.70 | 50.01 | 40.32 | 82.25 | 6057 | 15 |
| 252.856964 | 33.36 | 50.42 | 46.22 | 87.51 | 6046 | 15 |
| 252.927826 | 40.09 | 54.12 | 53.43 | 99.59 | 6055 | 22 |
| 252.981583 | 47.45 | 63.06 | 57.64 | 108.63 | 3138 | 22 |
| 253.016357 | 35.79 | 59.49 | 41.51 | 90.87 | 2787 | 9 |
| 253.068039 | 41.74 | 61.01 | 33.22 | 88.67 | 6052 | 9 |
| 253.138809 | 43.59 | 59.77 | 31.20 | 87.51 | 6050 | 7 |
| 253.209717 | 42.81 | 55.74 | 27.55 | 82.71 | 6054 | 7 |
| 253.280533 | 40.53 | 53.88 | 22.01 | 76.94 | 6050 | 6 |
| 253.351395 | 32.04 | 42.97 | 19.97 | 64.73 | 6058 | 6 |
| 253.422226 | 27.44 | 42.06 | 21.09 | 61.27 | 6059 | 5 |
| 253.493042 | 31.54 | 44.54 | 26.81 | 69.03 | 6056 | 5 |
| 253.563965 | 34.74 | 45.66 | 23.12 | 70.41 | 5990 | 7 |
| 253.634720 | 32.95 | 54.17 | 26.21 | 76.08 | 6053 | 4 |
| 253.705566 | 32.53 | 49.44 | 24.61 | 72.23 | 6054 | 4 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 253.776413 | 33.68 | 43.72 | 29.47 | 70.71 | 6055 | 2 |
| 253.847382 | 32.02 | 44.32 | 28.57 | 68.85 | 6020 | 2 |
| 253.918060 | 35.37 | 48.71 | 31.73 | 76.51 | 6057 | 0 |
| 253.977066 | 40.81 | 54.89 | 37.67 | 88.15 | 3901 | 0 |
| 254.011459 | 35.00 | 41.29 | 10.77 | 59.18 | 1961 | 0 |
| 254.058319 | 38.66 | 55.00 | 29.65 | 81.25 | 6050 | 0 |
| 254.129150 | 41.85 | 58.26 | 28.32 | 84.83 | 6050 | 2 |
| 254.199982 | 41.14 | 50.13 | 25.64 | 76.10 | 6055 | 2 |
| 254.270798 | 41.01 | 45.18 | 18.12 | 68.83 | 6059 | 3 |
| 254.341660 | 31.85 | 42.13 | 20.27 | 64.11 | 6057 | 3 |
| 254.412506 | 26.15 | 44.70 | 22.30 | 63.22 | 6059 | 6 |
| 254.483322 | 29.12 | 46.20 | 36.39 | 73.85 | 6057 | 6 |
| 254.554184 | 33.77 | 53.09 | 25.23 | 76.58 | 6033 | 4 |
| 254.625000 | 34.00 | 52.37 | 26.55 | 75.28 | 6052 | 5 |
| 254.695862 | 30.23 | 49.49 | 26.62 | 70.88 | 6042 | 5 |
| 254.766693 | 30.04 | 44.71 | 30.46 | 69.12 | 6054 | 6 |
| 254.837540 | 31.55 | 42.84 | 34.35 | 72.46 | 6055 | 6 |
| 254.908340 | 35.16 | 51.24 | 34.76 | 80.07 | 6049 | 5 |
| 254.971863 | 38.21 | 52.40 | 34.02 | 82.82 | 4799 | 5 |
| 255.006607 | 36.83 | 36.18 | 9.11 | 55.87 | 1129 | 0 |
| 255.048630 | 38.77 | 57.01 | 30.23 | 83.63 | 6055 | 0 |
| 255.119446 | 41.29 | 62.42 | 29.85 | 88.49 | 6056 | 0 |
| 255.190292 | 38.94 | 49.40 | 25.48 | 74.46 | 6048 | 0 |
| 255.261078 | 37.99 | 43.67 | 19.11 | 66.09 | 6055 | 2 |
| 255.331940 | 31.98 | 41.95 | 20.44 | 63.43 | 6062 | 2 |
| 255.402756 | 26.41 | 43.19 | 18.76 | 60.97 | 6054 | 4 |
| 255.473587 | 28.23 | 44.96 | 19.97 | 64.41 | 6054 | 4 |
| 255.544510 | 31.67 | 49.51 | 20.16 | 68.88 | 6025 | 5 |
| 255.615265 | 32.72 | 50.31 | 23.16 | 71.92 | 6057 | 5 |
| 255.686081 | 28.82 | 50.93 | 28.58 | 72.50 | 6043 | 9 |
| 255.756943 | 29.41 | 45.78 | 47.74 | 82.79 | 6048 | 5 |
| 255.827805 | 26.93 | 47.13 | 37.11 | 74.05 | 6056 | 5 |
| 255.898636 | 31.87 | 46.85 | 39.36 | 77.50 | 6059 | 6 |
| 255.967087 | 37.42 | 46.04 | 37.02 | 79.55 | 5630 | 6 |
| 256.001404 | 42.74 | 63.38 | 19.56 | 79.37 | 235 | 7 |
| 256.038147 | 39.77 | 63.62 | 44.70 | 97.80 | 6041 | 7 |
| 256.109009 | 43.24 | 65.28 | 42.44 | 99.59 | 6049 | 7 |
| 256.179871 | 38.98 | 81.58 | 69.62 | 126.77 | 6057 | 18 |
| 256.250702 | 39.51 | 58.45 | 37.03 | 88.20 | 6062 | 12 |
| 256.321533 | 34.92 | 50.96 | 21.21 | 71.87 | 6058 | 12 |
| 256.392365 | 29.18 | 57.26 | 38.85 | 84.74 | 6054 | 27 |
| 256.463165 | 33.51 | 67.00 | 59.02 | 107.81 | 6049 | 27 |
| 256.533997 | 36.41 | 77.85 | 65.36 | 123.81 | 6042 | 32 |
| 256.604828 | 34.73 | 77.38 | 66.37 | 123.85 | 6038 | 32 |
| 256.675659 | 34.79 | 73.54 | 56.83 | 114.57 | 6038 | 15 |
| 256.746552 | 36.88 | 76.41 | 61.67 | 121.98 | 6049 | 15 |
| 256.817383 | 37.84 | 72.05 | 56.59 | 118.11 | 6051 | 32 |
| 256.888214 | 40.33 | 64.68 | 62.35 | 114.72 | 6059 | 27 |
| 256.959015 | 43.92 | 54.14 | 38.98 | 92.21 | 6046 | 27 |
| 256.997162 | 22.37 | 88.46 | 14.82 | 94.63 | 423 | 27 |
| 257.031952 | 54.11 | 73.62 | 60.01 | 122.40 | 5460 | 27 |
| 257.099304 | 63.00 | 77.68 | 66.80 | 134.70 | 6054 | 27 |
| 257.170105 | 54.24 | 88.46 | 66.58 | 135.63 | 6045 | 22 |
| 257.240936 | 49.60 | 71.51 | 39.58 | 105.25 | 6059 | 22 |
| 257.311798 | 47.51 | 48.22 | 19.68 | 77.12 | 6062 | 6 |
| 257.382629 | 41.00 | 44.33 | 24.54 | 72.25 | 6061 | 3 |
| 257.453461 | 35.91 | 43.42 | 23.21 | 69.58 | 6052 | 3 |
| 257.524292 | 39.36 | 50.67 | 25.01 | 77.55 | 6046 | 5 |
| 257.595123 | 38.96 | 53.26 | 22.87 | 79.42 | 6057 | 5 |
| 257.665955 | 38.50 | 46.00 | 25.88 | 74.77 | 6051 | 5 |
| 257.737091 | 30.75 | 36.45 | 27.66 | 64.05 | 5996 | 5 |
| 257.807617 | 32.99 | 38.91 | 30.67 | 67.38 | 6041 | 4 |
| 257.878479 | 38.00 | 40.18 | 40.14 | 77.29 | 6058 | 6 |
| 257.949310 | 45.40 | 45.27 | 44.20 | 88.23 | 6052 | 6 |
| 257.992371 | 43.55 | 56.14 | 41.03 | 89.61 | 1307 | 6 |
| 258.027100 | 50.60 | 48.55 | 33.57 | 87.23 | 4622 | 4 |
| 258.089569 | 52.48 | 62.50 | 42.40 | 101.54 | 6057 | 4 |
| 258.160400 | 48.39 | 58.75 | 35.57 | 92.44 | 6057 | 7 |
| 258.231201 | 50.52 | 57.99 | 36.89 | 94.31 | 6054 | 7 |
| 258.302094 | 43.61 | 62.38 | 26.52 | 88.54 | 6063 | 6 |
| 258.372925 | 37.76 | 60.67 | 29.98 | 85.15 | 6060 | 6 |

| | | | | | | |
|------------|--------|--------|--------|--------|------|-----|
| 258.443756 | 34.97 | 51.39 | 23.55 | 73.50 | 6060 | 3 |
| 258.514618 | 34.99 | 47.50 | 24.80 | 72.66 | 6043 | 3 |
| 258.585388 | 37.73 | 55.78 | 24.55 | 80.86 | 6055 | 3 |
| 258.656250 | 36.33 | 48.38 | 36.15 | 81.00 | 6057 | 4 |
| 258.727112 | 29.85 | 42.59 | 40.64 | 76.68 | 6049 | 4 |
| 258.797943 | 30.23 | 44.46 | 39.10 | 75.80 | 6056 | 4 |
| 258.868774 | 32.05 | 46.26 | 36.15 | 74.86 | 6053 | 4 |
| 258.939606 | 39.35 | 51.33 | 38.35 | 83.15 | 6055 | 4 |
| 258.987488 | 47.32 | 57.94 | 51.57 | 98.66 | 2137 | 4 |
| 259.022247 | 36.87 | 52.00 | 27.61 | 77.60 | 3793 | 2 |
| 259.079926 | 43.38 | 60.03 | 35.68 | 91.54 | 6047 | 2 |
| 259.150696 | 41.02 | 62.14 | 30.79 | 89.03 | 6062 | 12 |
| 259.221588 | 38.54 | 54.84 | 23.42 | 77.65 | 6038 | 12 |
| 259.292358 | 37.51 | 46.14 | 17.49 | 67.67 | 6060 | 3 |
| 259.363159 | 29.85 | 43.01 | 22.21 | 63.75 | 6056 | 3 |
| 259.434021 | 26.28 | 42.60 | 18.94 | 59.77 | 6054 | 4 |
| 259.504852 | 30.04 | 45.99 | 23.01 | 66.88 | 6054 | 4 |
| 259.575714 | 33.58 | 52.62 | 22.55 | 73.84 | 6050 | 4 |
| 259.646515 | 31.34 | 52.33 | 26.00 | 73.90 | 6041 | 6 |
| 259.717346 | 27.41 | 47.62 | 25.32 | 67.37 | 6050 | 6 |
| 259.788208 | 28.56 | 45.99 | 32.34 | 69.73 | 6049 | 18 |
| 259.859009 | 28.48 | 50.79 | 53.61 | 90.92 | 6037 | 18 |
| 259.929901 | 38.98 | 70.25 | 75.24 | 127.12 | 6056 | 48 |
| 259.982635 | 45.53 | 70.12 | 59.59 | 118.51 | 2959 | 48 |
| 260.017029 | 36.19 | 72.91 | 65.94 | 125.20 | 2908 | 22 |
| 260.069427 | 42.12 | 77.97 | 53.31 | 118.95 | 6054 | 22 |
| 260.140228 | 40.38 | 63.11 | 42.02 | 97.89 | 6057 | 15 |
| 260.211060 | 40.18 | 57.41 | 30.39 | 83.21 | 6050 | 15 |
| 260.281952 | 39.44 | 54.40 | 23.38 | 78.82 | 6065 | 12 |
| 260.352753 | 29.01 | 59.03 | 35.42 | 85.02 | 6056 | 12 |
| 260.423584 | 25.73 | 53.01 | 32.55 | 75.47 | 6048 | 18 |
| 260.494446 | 31.65 | 52.06 | 55.27 | 92.43 | 6054 | 18 |
| 260.565277 | 33.26 | 62.92 | 50.71 | 99.43 | 6051 | 15 |
| 260.636078 | 30.61 | 56.97 | 45.64 | 91.78 | 6055 | 22 |
| 260.706970 | 33.67 | 55.05 | 40.72 | 88.19 | 6053 | 22 |
| 260.777863 | 30.81 | 67.45 | 59.32 | 107.48 | 6040 | 32 |
| 260.848633 | 30.65 | 54.34 | 63.21 | 101.15 | 6044 | 32 |
| 260.919464 | 48.20 | 113.01 | 105.65 | 186.15 | 6054 | 94 |
| 260.977356 | 52.85 | 85.81 | 73.32 | 138.86 | 3827 | 94 |
| 261.012177 | 52.70 | 86.26 | 66.02 | 136.63 | 2080 | 39 |
| 261.059753 | 45.39 | 81.84 | 45.38 | 117.53 | 6032 | 39 |
| 261.130463 | 53.22 | 78.94 | 54.03 | 122.37 | 6046 | 27 |
| 261.201294 | 44.31 | 65.69 | 34.31 | 95.46 | 6042 | 27 |
| 261.272339 | 45.88 | 55.39 | 23.38 | 82.19 | 5893 | 9 |
| 261.343018 | 34.58 | 53.25 | 29.77 | 78.78 | 5914 | 9 |
| 261.413879 | 30.38 | 48.74 | 28.79 | 73.21 | 5917 | 15 |
| 261.484711 | 32.21 | 56.28 | 35.45 | 84.02 | 5914 | 15 |
| 261.555511 | 38.93 | 74.63 | 55.57 | 114.36 | 5914 | 27 |
| 261.626373 | 32.30 | 61.53 | 44.55 | 93.40 | 5904 | 39 |
| 261.697266 | 28.06 | 56.25 | 55.63 | 96.54 | 5901 | 39 |
| 261.768097 | 32.41 | 80.88 | 54.23 | 115.33 | 5901 | 56 |
| 261.839020 | 28.95 | 65.37 | 69.06 | 115.87 | 5871 | 56 |
| 261.909760 | 85.17 | 308.13 | 216.56 | 416.76 | 5897 | 236 |
| 261.972504 | 100.65 | 141.79 | 99.03 | 231.40 | 4547 | 236 |
| 262.007294 | 75.10 | 359.80 | 83.95 | 392.79 | 1219 | 179 |
| 262.050140 | 80.92 | 153.45 | 86.09 | 225.53 | 6012 | 179 |
| 262.120850 | 70.51 | 111.22 | 72.98 | 174.88 | 6044 | 179 |
| 262.191681 | 64.21 | 109.23 | 80.28 | 170.72 | 6038 | 67 |
| 262.262512 | 60.70 | 83.57 | 53.20 | 131.55 | 6053 | 48 |
| 262.333344 | 48.56 | 71.50 | 42.36 | 112.04 | 6048 | 48 |
| 262.492279 | 38.99 | 56.25 | 49.84 | 99.13 | 3099 | 80 |
| 262.546143 | 40.44 | 75.85 | 35.05 | 104.61 | 5940 | 80 |
| 262.617584 | 41.93 | 91.19 | 78.50 | 143.20 | 5759 | 80 |
| 262.687500 | 45.95 | 67.44 | 42.51 | 111.01 | 6051 | 80 |
| 262.758362 | 45.80 | 59.95 | 37.73 | 103.64 | 6049 | 15 |
| 262.829285 | 46.49 | 58.80 | 46.35 | 106.88 | 6037 | 15 |
| 262.900024 | 45.00 | 55.31 | 42.78 | 100.21 | 6055 | 15 |
| 262.967712 | 51.32 | 64.19 | 44.58 | 105.67 | 5514 | 15 |
| 263.002441 | 42.91 | 131.08 | 21.98 | 140.02 | 414 | 15 |
| 263.040283 | 51.97 | 67.36 | 46.00 | 110.11 | 6052 | 15 |
| 263.111115 | 53.82 | 85.54 | 50.74 | 122.85 | 6059 | 15 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 263.181976 | 47.55 | 74.69 | 41.80 | 108.03 | 6054 | 15 |
| 263.252777 | 49.80 | 47.97 | 26.56 | 81.70 | 6061 | 15 |
| 263.323547 | 40.71 | 46.34 | 20.21 | 72.03 | 6051 | 15 |
| 263.394562 | 31.50 | 71.50 | 47.05 | 102.55 | 6023 | 48 |
| 263.465302 | 38.74 | 100.46 | 86.20 | 154.47 | 6034 | 48 |
| 263.536133 | 46.71 | 105.90 | 82.57 | 157.78 | 6040 | 80 |
| 263.606934 | 40.85 | 78.29 | 54.33 | 120.54 | 6043 | 80 |
| 263.677795 | 41.18 | 65.15 | 33.83 | 100.83 | 6051 | 27 |
| 263.748627 | 40.52 | 52.85 | 43.81 | 97.49 | 6047 | 27 |
| 263.819458 | 42.64 | 53.58 | 31.55 | 89.73 | 6057 | 15 |
| 263.890320 | 45.41 | 52.26 | 49.00 | 98.64 | 6059 | 22 |
| 263.961121 | 49.63 | 64.00 | 53.78 | 111.09 | 6059 | 22 |
| 263.998260 | 21.88 | 113.76 | 20.10 | 119.41 | 295 | 22 |
| 264.032654 | 54.49 | 54.29 | 51.39 | 108.23 | 5576 | 22 |
| 264.100708 | 50.90 | 62.55 | 36.86 | 97.98 | 6058 | 22 |
| 264.171539 | 47.15 | 87.05 | 64.70 | 130.87 | 6055 | 22 |
| 264.242371 | 47.86 | 41.17 | 23.33 | 74.97 | 6061 | 22 |
| 264.313202 | 42.64 | 38.03 | 19.87 | 68.06 | 6055 | 4 |
| 264.384033 | 35.52 | 39.79 | 21.16 | 66.35 | 6059 | 12 |
| 264.454865 | 34.27 | 45.80 | 22.89 | 69.79 | 6057 | 12 |
| 264.525696 | 36.00 | 64.30 | 42.94 | 94.99 | 6047 | 18 |
| 264.596527 | 37.70 | 57.13 | 28.75 | 85.92 | 6054 | 18 |
| 264.667358 | 36.66 | 53.50 | 28.57 | 82.05 | 6054 | 7 |
| 264.736664 | 36.94 | 51.40 | 40.05 | 85.68 | 5749 | 7 |
| 264.808563 | 40.50 | 46.37 | 32.96 | 80.20 | 5784 | 6 |
| 264.879883 | 41.71 | 45.79 | 34.96 | 79.55 | 6055 | 6 |
| 264.950714 | 49.56 | 49.63 | 42.20 | 92.10 | 6060 | 6 |
| 264.993042 | 48.48 | 46.41 | 29.80 | 85.99 | 1187 | 6 |
| 265.027802 | 51.16 | 45.29 | 36.67 | 86.60 | 4742 | 7 |
| 265.090973 | 52.54 | 58.84 | 35.61 | 95.81 | 6055 | 7 |
| 265.161774 | 52.28 | 62.24 | 44.61 | 101.95 | 6039 | 12 |
| 265.232605 | 52.36 | 67.26 | 35.72 | 101.28 | 6049 | 12 |
| 265.303467 | 48.32 | 44.66 | 18.26 | 75.16 | 6061 | 7 |
| 265.374268 | 39.95 | 69.72 | 50.20 | 106.87 | 6047 | 7 |
| 265.445160 | 35.62 | 59.25 | 37.58 | 86.47 | 6044 | 15 |
| 265.515961 | 38.90 | 52.23 | 31.75 | 82.52 | 6056 | 12 |
| 265.586792 | 38.77 | 60.28 | 30.65 | 87.23 | 6055 | 12 |
| 265.657623 | 40.86 | 48.81 | 21.93 | 77.51 | 6055 | 6 |
| 265.728485 | 33.93 | 44.70 | 29.03 | 72.96 | 6054 | 6 |
| 265.799316 | 35.87 | 42.67 | 42.27 | 80.62 | 6054 | 7 |
| 265.870178 | 37.29 | 40.05 | 38.23 | 76.17 | 6054 | 7 |
| 265.940979 | 44.35 | 43.41 | 39.36 | 82.54 | 6056 | 6 |
| 265.988190 | 56.80 | 62.23 | 62.62 | 116.59 | 2018 | 6 |
| 266.022949 | 42.88 | 52.30 | 42.04 | 88.21 | 3911 | 12 |
| 266.076019 | 51.22 | 60.18 | 58.88 | 110.59 | 5149 | 12 |
| 266.152069 | 47.99 | 60.48 | 33.81 | 92.30 | 6056 | 9 |
| 266.222900 | 47.10 | 58.66 | 36.93 | 91.05 | 6057 | 9 |
| 266.293671 | 44.33 | 54.95 | 23.47 | 80.91 | 6050 | 6 |
| 266.364563 | 36.46 | 45.40 | 25.37 | 70.34 | 6050 | 6 |
| 266.512238 | 36.99 | 47.29 | 36.82 | 79.80 | 5028 | 6 |
| 266.577026 | 36.81 | 50.62 | 24.48 | 76.38 | 6049 | 6 |
| 266.647919 | 36.33 | 51.88 | 25.67 | 76.91 | 6058 | 5 |
| 266.718750 | 32.35 | 45.97 | 28.16 | 72.10 | 6047 | 5 |
| 266.789551 | 33.69 | 43.67 | 32.50 | 73.60 | 6047 | 6 |
| 266.860443 | 34.95 | 44.49 | 30.36 | 72.63 | 6052 | 6 |
| 266.931274 | 42.01 | 45.93 | 31.85 | 77.54 | 6056 | 3 |
| 266.983337 | 52.23 | 47.55 | 42.00 | 91.46 | 2841 | 3 |
| 267.018066 | 35.40 | 41.85 | 31.08 | 72.89 | 3085 | 7 |
| 267.071533 | 49.96 | 53.36 | 47.91 | 97.76 | 6050 | 7 |
| 267.142365 | 48.18 | 62.31 | 47.94 | 102.73 | 6064 | 15 |
| 267.213196 | 46.80 | 59.50 | 37.28 | 91.67 | 6061 | 15 |
| 267.283966 | 44.51 | 49.53 | 21.56 | 75.25 | 6046 | 6 |
| 267.354858 | 36.18 | 40.00 | 19.47 | 63.99 | 6062 | 6 |
| 267.425659 | 31.38 | 42.22 | 22.10 | 64.82 | 6055 | 4 |
| 267.496521 | 34.32 | 47.84 | 34.21 | 79.97 | 6056 | 4 |
| 267.567352 | 36.60 | 49.76 | 25.61 | 76.17 | 6053 | 6 |
| 267.638184 | 36.10 | 46.17 | 27.78 | 74.09 | 6054 | 6 |
| 267.709015 | 33.62 | 45.63 | 32.18 | 75.02 | 6051 | 6 |
| 267.779907 | 33.04 | 44.60 | 32.02 | 73.62 | 6043 | 5 |
| 267.850708 | 32.13 | 43.57 | 28.27 | 71.30 | 6056 | 5 |
| 267.921570 | 37.01 | 50.30 | 35.38 | 81.38 | 6060 | 4 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 267.978455 | 41.07 | 52.56 | 42.45 | 87.96 | 3673 | 4 |
| 268.012848 | 36.30 | 42.81 | 27.38 | 71.66 | 2201 | 2 |
| 268.061035 | 38.98 | 56.47 | 34.21 | 85.39 | 6042 | 2 |
| 268.131927 | 39.86 | 62.51 | 30.08 | 88.54 | 6064 | 5 |
| 268.202789 | 40.40 | 53.90 | 25.17 | 79.04 | 6060 | 5 |
| 268.273590 | 41.25 | 54.53 | 20.55 | 78.34 | 6065 | 3 |
| 268.344452 | 32.31 | 55.08 | 24.08 | 76.48 | 6060 | 3 |
| 268.415253 | 28.24 | 42.32 | 21.45 | 62.23 | 6059 | 4 |
| 268.486115 | 31.50 | 47.12 | 26.92 | 71.08 | 6058 | 4 |
| 268.556885 | 34.95 | 45.99 | 21.21 | 69.52 | 6043 | 5 |
| 268.627777 | 32.82 | 56.01 | 27.99 | 79.36 | 6044 | 15 |
| 268.698608 | 32.82 | 48.18 | 42.02 | 82.30 | 6041 | 15 |
| 268.769470 | 31.25 | 54.30 | 43.10 | 87.21 | 6052 | 48 |
| 268.840302 | 35.59 | 64.37 | 76.55 | 123.08 | 6055 | 48 |
| 268.911133 | 38.90 | 65.75 | 59.32 | 110.26 | 6057 | 18 |
| 268.973267 | 46.04 | 60.19 | 48.51 | 101.76 | 4560 | 18 |
| 269.007996 | 28.54 | 58.84 | 21.77 | 73.42 | 1365 | 12 |
| 269.051392 | 43.58 | 69.58 | 51.75 | 109.70 | 6052 | 12 |
| 269.122253 | 45.47 | 77.96 | 43.11 | 109.89 | 6042 | 12 |
| 269.193054 | 43.39 | 65.76 | 32.96 | 95.98 | 6044 | 12 |
| 269.270325 | 38.99 | 63.56 | 35.83 | 94.46 | 4874 | 15 |
| 269.325836 | 38.48 | 56.78 | 39.65 | 91.49 | 4535 | 15 |
| 269.405579 | 28.04 | 60.13 | 44.48 | 93.25 | 6055 | 18 |
| 269.476379 | 32.97 | 56.47 | 39.00 | 84.76 | 6056 | 18 |
| 269.547241 | 34.15 | 55.02 | 25.99 | 77.81 | 6038 | 18 |
| 269.618073 | 37.82 | 58.15 | 63.68 | 109.86 | 6050 | 18 |
| 269.688934 | 36.80 | 75.69 | 65.89 | 121.42 | 6040 | 27 |
| 269.759735 | 38.77 | 81.62 | 65.27 | 126.50 | 6048 | 22 |
| 269.830536 | 35.46 | 68.29 | 61.83 | 111.37 | 6038 | 22 |
| 269.901428 | 42.88 | 72.42 | 76.05 | 129.74 | 6056 | 27 |
| 269.968384 | 50.51 | 62.37 | 70.14 | 122.08 | 5383 | 27 |
| 270.003082 | 47.23 | 95.80 | 26.82 | 111.01 | 525 | 39 |
| 270.041656 | 52.48 | 87.67 | 76.87 | 144.00 | 6051 | 39 |
| 270.112488 | 55.58 | 75.33 | 64.52 | 130.02 | 6058 | 39 |
| 270.183197 | 49.80 | 69.55 | 40.53 | 105.09 | 5956 | 27 |
| 270.254211 | 47.09 | 77.01 | 48.51 | 116.69 | 6050 | 22 |
| 270.323700 | 42.38 | 61.62 | 29.79 | 89.64 | 5838 | 22 |
| 270.395844 | 33.89 | 69.87 | 57.27 | 109.14 | 6058 | 22 |
| 270.466644 | 36.13 | 64.50 | 52.38 | 102.53 | 6054 | 22 |
| 270.537476 | 36.61 | 55.66 | 46.38 | 92.41 | 6047 | 32 |
| 270.608307 | 38.81 | 71.33 | 76.66 | 129.59 | 6055 | 32 |
| 270.679169 | 38.71 | 53.78 | 48.64 | 97.23 | 6044 | 15 |
| 270.750061 | 33.27 | 52.48 | 44.79 | 89.91 | 6050 | 15 |
| 270.820831 | 36.83 | 59.81 | 61.29 | 106.87 | 6035 | 15 |
| 270.891693 | 39.13 | 54.76 | 46.55 | 94.86 | 6059 | 18 |
| 270.962524 | 44.78 | 54.40 | 51.18 | 98.29 | 6054 | 18 |
| 270.998932 | 20.40 | 115.73 | 11.80 | 118.42 | 177 | 18 |
| 271.033722 | 49.81 | 60.15 | 37.49 | 96.74 | 5736 | 12 |
| 271.102753 | 48.84 | 61.65 | 45.25 | 100.87 | 6058 | 12 |
| 271.173615 | 46.43 | 58.49 | 36.22 | 92.00 | 6056 | 12 |
| 271.244446 | 44.64 | 80.04 | 46.00 | 114.26 | 6049 | 12 |
| 271.315216 | 40.51 | 58.23 | 26.79 | 84.79 | 6055 | 18 |
| 271.386108 | 34.72 | 53.08 | 31.61 | 79.66 | 6060 | 12 |
| 271.456940 | 31.91 | 47.23 | 30.78 | 73.33 | 6061 | 12 |
| 271.527771 | 35.86 | 52.73 | 35.06 | 82.31 | 6053 | 9 |
| 271.598602 | 38.60 | 51.58 | 39.50 | 86.52 | 6051 | 9 |
| 271.669434 | 35.04 | 50.60 | 31.81 | 79.61 | 6048 | 9 |
| 271.740326 | 31.39 | 50.69 | 38.97 | 80.50 | 6050 | 9 |
| 271.811188 | 34.29 | 44.80 | 44.98 | 82.54 | 6042 | 7 |
| 271.881989 | 35.13 | 48.59 | 52.20 | 88.97 | 6045 | 12 |
| 271.952850 | 42.55 | 61.93 | 48.04 | 101.26 | 6041 | 12 |
| 271.994110 | 35.24 | 58.77 | 35.47 | 84.74 | 1002 | 12 |
| 272.028503 | 47.02 | 56.65 | 54.59 | 103.50 | 4863 | 9 |
| 272.092346 | 48.06 | 67.41 | 52.04 | 108.68 | 6053 | 9 |
| 272.163177 | 48.57 | 75.42 | 59.79 | 119.38 | 6047 | 22 |
| 272.234039 | 43.00 | 51.09 | 27.86 | 79.47 | 6044 | 22 |
| 272.304840 | 41.45 | 50.70 | 19.78 | 74.76 | 6052 | 6 |
| 272.375641 | 32.38 | 56.10 | 36.14 | 82.70 | 6049 | 18 |
| 272.446533 | 31.67 | 52.21 | 51.33 | 91.43 | 6058 | 18 |
| 272.517334 | 34.66 | 54.45 | 55.30 | 96.97 | 6052 | 18 |
| 272.588196 | 35.43 | 61.54 | 60.23 | 108.23 | 6056 | 18 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|----|
| 272.659241 | 41.19 | 56.20 | 50.30 | 100.79 | 5479 | 12 |
| 272.729889 | 33.89 | 43.54 | 37.37 | 79.06 | 6052 | 12 |
| 272.800720 | 34.99 | 44.80 | 37.00 | 78.67 | 6053 | 4 |
| 272.871552 | 39.39 | 41.88 | 38.27 | 78.20 | 6054 | 4 |
| 272.942383 | 47.30 | 47.46 | 37.39 | 84.79 | 6056 | 3 |
| 272.988922 | 61.38 | 54.01 | 47.38 | 103.53 | 1887 | 3 |
| 273.023651 | 42.91 | 48.34 | 26.50 | 77.35 | 4033 | 7 |
| 273.082611 | 51.86 | 57.75 | 41.26 | 95.97 | 6051 | 7 |
| 273.153503 | 49.30 | 54.38 | 37.28 | 91.44 | 6049 | 9 |
| 273.224304 | 49.79 | 44.21 | 26.47 | 77.63 | 6058 | 9 |
| 273.294952 | 48.23 | 42.08 | 18.38 | 72.24 | 6001 | 3 |
| 273.366089 | 39.73 | 42.95 | 23.62 | 70.07 | 6039 | 3 |
| 273.436829 | 34.56 | 45.44 | 28.41 | 72.75 | 6060 | 9 |
| 273.507629 | 36.34 | 52.10 | 33.71 | 81.96 | 6054 | 7 |
| 273.578461 | 39.32 | 60.91 | 34.54 | 91.55 | 6053 | 7 |
| 273.649292 | 38.07 | 54.38 | 43.02 | 90.62 | 6055 | 6 |
| 273.720184 | 34.11 | 51.70 | 36.06 | 83.30 | 6044 | 6 |
| 273.791016 | 34.13 | 47.84 | 39.16 | 81.57 | 6036 | 6 |
| 273.861816 | 37.47 | 47.15 | 41.75 | 85.20 | 6043 | 6 |
| 273.932648 | 45.56 | 51.27 | 43.67 | 93.93 | 6059 | 6 |
| 273.984039 | 57.27 | 53.67 | 45.52 | 105.08 | 2726 | 6 |
| 274.018829 | 42.77 | 52.46 | 47.41 | 92.27 | 3195 | 18 |
| 274.072906 | 54.91 | 62.24 | 64.84 | 119.78 | 6044 | 18 |
| 274.143738 | 52.45 | 75.34 | 64.99 | 125.42 | 6059 | 27 |
| 274.214569 | 47.62 | 104.35 | 59.95 | 140.89 | 6048 | 27 |
| 274.285370 | 48.76 | 123.96 | 73.56 | 167.90 | 6056 | 56 |
| 274.356232 | 42.75 | 96.47 | 72.39 | 143.16 | 6055 | 56 |
| 274.427094 | 36.04 | 80.51 | 72.27 | 125.64 | 6052 | 48 |
| 274.497894 | 41.04 | 106.12 | 115.38 | 181.87 | 6037 | 48 |
| 274.568787 | 42.16 | 92.64 | 80.71 | 149.03 | 6031 | 67 |
| 274.639526 | 40.22 | 79.39 | 55.27 | 123.11 | 6044 | 48 |
| 274.710480 | 42.40 | 65.70 | 48.88 | 106.74 | 6032 | 48 |
| 274.781250 | 37.03 | 48.54 | 32.01 | 81.53 | 6048 | 48 |
| 274.852112 | 45.41 | 89.24 | 75.27 | 142.32 | 6055 | 48 |
| 274.922943 | 59.14 | 97.40 | 78.87 | 156.49 | 6050 | 94 |
| 274.979156 | 55.87 | 72.61 | 48.41 | 118.10 | 3549 | 94 |
| 275.013885 | 55.02 | 56.42 | 42.56 | 104.22 | 2377 | 27 |
| 275.063202 | 53.15 | 62.62 | 36.48 | 100.28 | 6045 | 27 |
| 275.134064 | 52.24 | 71.03 | 45.19 | 109.09 | 6038 | 22 |
| 275.204865 | 52.70 | 69.64 | 37.52 | 104.04 | 6056 | 22 |
| 275.275696 | 50.03 | 72.81 | 49.15 | 112.01 | 6060 | 18 |
| 275.346527 | 41.68 | 55.78 | 32.65 | 86.82 | 6057 | 18 |
| 275.417358 | 36.19 | 45.19 | 31.23 | 76.12 | 6059 | 7 |
| 275.488190 | 37.51 | 49.13 | 37.12 | 82.26 | 6050 | 7 |
| 275.558990 | 38.75 | 51.80 | 31.06 | 81.45 | 6041 | 6 |
| 275.629883 | 39.70 | 50.68 | 24.85 | 79.04 | 6037 | 12 |
| 275.700714 | 37.86 | 48.17 | 33.78 | 81.60 | 6051 | 12 |
| 275.771515 | 33.30 | 45.63 | 32.75 | 74.67 | 6043 | 6 |
| 275.842377 | 36.84 | 42.38 | 31.57 | 74.06 | 6055 | 6 |
| 275.913239 | 42.60 | 45.69 | 33.83 | 79.26 | 6052 | 4 |
| 275.974304 | 50.14 | 51.10 | 35.90 | 88.03 | 4387 | 4 |
| 276.008698 | 31.95 | 33.20 | 8.62 | 50.29 | 1486 | 2 |
| 276.052765 | 46.55 | 53.88 | 32.27 | 86.55 | 6047 | 2 |
| 276.123596 | 48.68 | 53.51 | 30.72 | 86.82 | 6061 | 2 |
| 276.194458 | 47.47 | 53.20 | 25.68 | 81.48 | 6044 | 4 |
| 276.265259 | 46.71 | 57.21 | 21.36 | 82.12 | 6059 | 5 |
| 276.336121 | 37.71 | 61.85 | 31.88 | 88.42 | 6053 | 5 |
| 276.406952 | 30.60 | 68.88 | 42.77 | 97.82 | 6058 | 6 |
| 276.477783 | 35.16 | 58.58 | 49.02 | 94.62 | 6059 | 6 |
| 276.548615 | 33.61 | 60.76 | 53.70 | 100.43 | 6050 | 9 |
| 276.619476 | 36.95 | 63.79 | 45.77 | 97.37 | 6038 | 9 |
| 276.690277 | 41.57 | 69.10 | 73.64 | 126.00 | 6053 | 32 |
| 276.761108 | 33.28 | 60.18 | 48.91 | 97.57 | 6046 | 9 |
| 276.831970 | 35.87 | 50.93 | 45.10 | 88.61 | 6053 | 9 |
| 276.902802 | 42.53 | 59.67 | 57.23 | 106.52 | 6059 | 12 |
| 276.969116 | 50.57 | 58.51 | 60.51 | 111.71 | 5273 | 12 |
| 277.003815 | 51.84 | 99.41 | 41.52 | 122.02 | 650 | 32 |
| 277.043030 | 51.75 | 68.93 | 52.96 | 116.88 | 6049 | 32 |
| 277.113892 | 56.23 | 78.86 | 79.94 | 143.34 | 6041 | 32 |
| 277.255737 | 49.67 | 93.27 | 84.95 | 155.29 | 6014 | 48 |
| 277.326355 | 43.72 | 108.42 | 72.72 | 156.58 | 6043 | 48 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|-----|
| 277.397156 | 40.78 | 115.32 | 104.72 | 180.35 | 6029 | 27 |
| 277.468018 | 42.76 | 88.14 | 88.43 | 151.38 | 6041 | 27 |
| 277.538910 | 46.09 | 104.36 | 84.02 | 158.89 | 6041 | 56 |
| 277.609711 | 41.07 | 74.03 | 68.71 | 128.96 | 6055 | 56 |
| 277.680603 | 43.71 | 62.97 | 69.49 | 120.71 | 6044 | 27 |
| 277.751434 | 38.61 | 59.80 | 57.96 | 105.78 | 6047 | 5 |
| 277.822266 | 42.19 | 52.94 | 53.04 | 99.82 | 6054 | 5 |
| 277.893066 | 44.92 | 50.21 | 55.77 | 100.99 | 6056 | 7 |
| 277.963928 | 48.72 | 49.45 | 50.42 | 97.59 | 6054 | 7 |
| 277.999664 | 37.07 | 114.50 | 11.12 | 121.12 | 58 | 7 |
| 278.034363 | 51.82 | 53.13 | 39.47 | 94.09 | 5871 | 7 |
| 278.104156 | 52.51 | 63.71 | 39.46 | 100.41 | 6048 | 7 |
| 278.174988 | 49.67 | 80.85 | 46.56 | 117.52 | 6054 | 18 |
| 278.245819 | 47.44 | 85.37 | 46.57 | 122.19 | 6049 | 18 |
| 278.316711 | 41.00 | 122.85 | 81.11 | 171.49 | 6043 | 48 |
| 278.387512 | 41.43 | 98.21 | 74.88 | 145.80 | 6040 | 48 |
| 278.458344 | 41.65 | 83.48 | 80.25 | 139.86 | 6051 | 48 |
| 278.529175 | 47.12 | 90.39 | 84.06 | 152.49 | 6047 | 94 |
| 278.599976 | 49.87 | 108.42 | 109.66 | 190.18 | 6047 | 94 |
| 278.670837 | 55.29 | 112.28 | 75.61 | 168.37 | 6050 | 67 |
| 278.741699 | 62.52 | 139.78 | 94.78 | 204.74 | 6046 | 67 |
| 278.812714 | 65.62 | 127.26 | 86.21 | 195.00 | 5992 | 154 |
| 278.883362 | 66.58 | 104.66 | 95.73 | 183.02 | 6055 | 67 |
| 278.954193 | 71.49 | 110.31 | 82.56 | 175.55 | 6052 | 67 |
| 278.994781 | 60.49 | 118.80 | 65.29 | 179.54 | 889 | 67 |
| 279.029449 | 76.38 | 93.96 | 57.45 | 152.99 | 5029 | 56 |
| 279.094452 | 79.04 | 111.44 | 84.70 | 180.02 | 6056 | 56 |
| 279.165283 | 75.05 | 114.22 | 110.84 | 200.25 | 6036 | 111 |
| 279.234467 | 89.75 | 144.60 | 146.62 | 246.96 | 5556 | 111 |
| 279.307007 | 72.49 | 168.70 | 124.64 | 242.78 | 6041 | 179 |
| 279.377808 | 61.32 | 102.20 | 63.23 | 150.58 | 6055 | 154 |
| 279.448608 | 51.79 | 85.53 | 49.60 | 127.39 | 6055 | 154 |
| 279.518311 | 76.18 | 152.66 | 138.68 | 246.59 | 5819 | 179 |
| 279.591553 | 71.38 | 150.04 | 100.16 | 217.40 | 5693 | 179 |
| 279.661102 | 83.54 | 143.23 | 103.01 | 216.15 | 6045 | 111 |
| 279.731934 | 72.37 | 128.82 | 72.14 | 183.35 | 6045 | 111 |
| 279.802826 | 69.21 | 113.33 | 50.14 | 164.01 | 6040 | 94 |
| 279.873840 | 68.91 | 101.21 | 63.48 | 159.19 | 5992 | 94 |
| 279.944458 | 70.18 | 88.73 | 61.77 | 146.87 | 6059 | 48 |
| 279.989929 | 95.81 | 73.73 | 50.71 | 152.92 | 1716 | 48 |
| 280.024323 | 58.10 | 78.74 | 51.58 | 123.05 | 4151 | 12 |
| 280.084015 | 69.02 | 75.37 | 39.65 | 124.02 | 6057 | 12 |
| 280.154846 | 65.98 | 69.15 | 30.65 | 111.10 | 6064 | 3 |
| 280.225647 | 64.88 | 56.22 | 26.39 | 101.32 | 6053 | 3 |
| 280.295166 | 63.52 | 51.11 | 22.93 | 93.61 | 5832 | 3 |
| 280.367493 | 52.41 | 49.09 | 24.37 | 86.82 | 6038 | 3 |
| 280.438232 | 44.90 | 51.07 | 24.14 | 84.20 | 6053 | 2 |
| 280.509216 | 44.47 | 55.85 | 30.33 | 88.16 | 5998 | 4 |
| 280.579865 | 46.34 | 58.56 | 25.37 | 90.42 | 6052 | 4 |
| 280.650665 | 47.88 | 55.54 | 21.75 | 88.24 | 6057 | 2 |
| 280.721527 | 44.54 | 55.62 | 24.16 | 87.56 | 6049 | 2 |
| 280.792358 | 44.61 | 51.05 | 27.09 | 84.57 | 6049 | 4 |
| 280.863220 | 47.64 | 51.26 | 27.10 | 85.24 | 6053 | 4 |
| 280.934052 | 53.20 | 49.43 | 30.27 | 87.36 | 6060 | 3 |
| 280.984711 | 65.00 | 51.53 | 37.25 | 102.47 | 2608 | 3 |
| 281.019196 | 44.03 | 48.47 | 25.87 | 77.64 | 3257 | 0 |
| 281.074219 | 56.77 | 60.61 | 35.49 | 99.63 | 6041 | 0 |
| 281.145142 | 56.21 | 66.75 | 33.99 | 101.28 | 6059 | 4 |
| 281.215973 | 54.34 | 63.05 | 35.43 | 98.08 | 6056 | 4 |
| 281.286804 | 52.58 | 72.44 | 25.03 | 101.33 | 6065 | 5 |
| 281.357635 | 42.65 | 55.12 | 28.17 | 84.52 | 6058 | 5 |
| 281.428467 | 36.48 | 51.05 | 26.63 | 76.02 | 6060 | 4 |
| 281.499298 | 38.07 | 56.26 | 38.82 | 87.99 | 6053 | 4 |
| 281.570068 | 40.90 | 63.25 | 44.83 | 100.65 | 6039 | 9 |
| 281.640961 | 40.28 | 56.63 | 32.34 | 89.04 | 6058 | 6 |
| 281.711823 | 40.22 | 52.68 | 32.56 | 85.12 | 6056 | 6 |
| 281.782654 | 38.14 | 47.46 | 34.25 | 82.00 | 6051 | 6 |
| 281.853180 | 40.08 | 46.00 | 32.04 | 78.46 | 5989 | 6 |
| 281.924316 | 46.11 | 45.05 | 34.20 | 81.20 | 6060 | 0 |
| 281.979828 | 53.01 | 49.17 | 41.91 | 93.27 | 3429 | 0 |
| 282.014618 | 42.11 | 48.12 | 18.92 | 72.07 | 2491 | 0 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 282.064545 | 49.63 | 53.92 | 33.50 | 88.76 | 6046 | 0 |
| 282.135376 | 52.33 | 59.48 | 33.30 | 93.87 | 6058 | 2 |
| 282.206024 | 49.34 | 53.18 | 29.00 | 84.70 | 5992 | 2 |
| 282.277069 | 50.20 | 40.86 | 18.56 | 72.06 | 6058 | 2 |
| 282.347900 | 39.93 | 39.50 | 20.34 | 67.08 | 6062 | 2 |
| 282.418732 | 34.93 | 40.75 | 21.35 | 65.80 | 6056 | 2 |
| 282.489594 | 35.01 | 48.19 | 23.80 | 73.63 | 6047 | 2 |
| 282.560394 | 37.30 | 52.32 | 22.11 | 76.62 | 6051 | 2 |
| 282.631256 | 38.79 | 50.89 | 28.94 | 80.16 | 6052 | 2 |
| 282.702332 | 36.99 | 45.99 | 24.71 | 73.47 | 5998 | 2 |
| 282.772858 | 33.60 | 41.88 | 30.71 | 71.98 | 6038 | 3 |
| 282.843781 | 35.50 | 43.11 | 31.45 | 73.99 | 6047 | 3 |
| 282.914825 | 42.16 | 45.05 | 43.26 | 84.90 | 6014 | 7 |
| 282.975220 | 51.37 | 58.30 | 49.53 | 102.40 | 4209 | 7 |
| 283.009705 | 33.85 | 39.30 | 22.51 | 65.95 | 1664 | 3 |
| 283.055176 | 47.30 | 54.73 | 32.15 | 87.97 | 5991 | 3 |
| 283.125763 | 47.34 | 56.47 | 26.35 | 85.73 | 6046 | 2 |
| 283.196533 | 46.61 | 47.99 | 25.14 | 77.79 | 6061 | 2 |
| 283.267365 | 46.77 | 43.29 | 20.67 | 71.69 | 6061 | 2 |
| 283.338196 | 37.45 | 42.84 | 21.89 | 68.41 | 6060 | 2 |
| 283.408997 | 32.89 | 42.00 | 21.99 | 65.49 | 6049 | 2 |
| 283.479858 | 32.62 | 46.58 | 26.53 | 72.23 | 6055 | 2 |
| 283.550690 | 35.45 | 49.68 | 25.37 | 75.75 | 6050 | 4 |
| 283.621490 | 36.97 | 53.15 | 34.83 | 84.14 | 6055 | 4 |
| 283.692352 | 35.53 | 46.68 | 36.50 | 80.57 | 6045 | 4 |
| 283.763214 | 32.86 | 47.89 | 44.82 | 85.03 | 6050 | 6 |
| 283.834015 | 33.79 | 46.72 | 37.69 | 81.73 | 6046 | 6 |
| 283.904877 | 36.19 | 49.94 | 39.84 | 83.51 | 6055 | 7 |
| 283.970245 | 42.18 | 53.14 | 49.68 | 95.42 | 5089 | 7 |
| 284.004517 | 40.66 | 53.20 | 15.11 | 71.70 | 773 | 7 |
| 284.044464 | 42.72 | 59.56 | 48.04 | 99.50 | 6054 | 7 |
| 284.115265 | 45.00 | 62.59 | 43.50 | 99.98 | 6051 | 7 |
| 284.186096 | 41.64 | 69.25 | 38.53 | 97.50 | 6042 | 9 |
| 284.256897 | 44.05 | 59.26 | 41.79 | 94.41 | 6049 | 15 |
| 284.327759 | 34.30 | 76.22 | 36.25 | 101.25 | 6046 | 15 |
| 284.398621 | 31.19 | 77.73 | 53.66 | 112.93 | 6053 | 9 |
| 284.469421 | 33.28 | 65.23 | 55.06 | 101.85 | 6051 | 9 |
| 284.540253 | 33.21 | 57.93 | 42.13 | 88.61 | 6053 | 6 |
| 284.611115 | 34.97 | 59.41 | 45.54 | 94.15 | 6054 | 6 |
| 284.681976 | 34.92 | 59.20 | 41.29 | 91.57 | 6057 | 7 |
| 284.752838 | 34.92 | 46.72 | 30.48 | 77.24 | 6042 | 4 |
| 284.823944 | 33.88 | 44.61 | 31.79 | 73.14 | 5992 | 4 |
| 284.894501 | 35.32 | 49.99 | 40.80 | 82.07 | 6059 | 7 |
| 284.965057 | 42.65 | 51.08 | 36.64 | 85.17 | 5971 | 7 |
| 285.035309 | 42.03 | 63.64 | 50.90 | 102.32 | 5944 | 27 |
| 285.105530 | 48.97 | 78.32 | 74.31 | 132.70 | 6051 | 27 |
| 285.176361 | 46.57 | 77.29 | 77.64 | 133.24 | 6041 | 39 |
| 285.247223 | 40.65 | 104.66 | 67.85 | 145.00 | 6056 | 39 |
| 285.317993 | 34.01 | 75.89 | 41.63 | 103.28 | 6053 | 9 |
| 285.388947 | 31.66 | 53.25 | 37.53 | 81.81 | 6055 | 6 |
| 285.459717 | 30.55 | 55.50 | 35.25 | 80.26 | 6060 | 6 |
| 285.530548 | 35.78 | 54.61 | 52.20 | 95.62 | 6051 | 12 |
| 285.601379 | 34.93 | 57.11 | 33.66 | 86.04 | 6054 | 12 |
| 285.672241 | 34.35 | 48.48 | 27.66 | 76.35 | 6051 | 5 |
| 285.743073 | 37.57 | 48.40 | 36.66 | 82.22 | 6050 | 5 |
| 285.813904 | 36.49 | 58.10 | 50.81 | 97.35 | 6052 | 18 |
| 285.884735 | 35.25 | 52.04 | 49.30 | 89.89 | 6057 | 4 |
| 285.955048 | 42.15 | 51.86 | 40.73 | 88.36 | 5958 | 4 |
| 285.995941 | 27.26 | 47.14 | 27.21 | 66.88 | 652 | 4 |
| 286.030243 | 48.21 | 57.68 | 40.56 | 95.55 | 5163 | 9 |
| 286.095825 | 49.12 | 57.40 | 38.26 | 93.96 | 6056 | 9 |
| 286.166626 | 45.72 | 61.13 | 30.88 | 90.49 | 6043 | 4 |
| 286.237671 | 46.92 | 49.43 | 25.24 | 78.92 | 5965 | 4 |
| 286.308350 | 42.90 | 50.43 | 22.37 | 76.37 | 6059 | 4 |
| 286.379181 | 35.27 | 46.19 | 25.64 | 72.01 | 6057 | 5 |
| 286.449982 | 33.10 | 47.10 | 33.93 | 75.72 | 6059 | 5 |
| 286.520752 | 35.94 | 49.51 | 28.62 | 75.61 | 6037 | 6 |
| 286.591644 | 37.66 | 53.39 | 35.43 | 84.47 | 6050 | 6 |
| 286.662476 | 34.61 | 48.40 | 34.20 | 77.65 | 6052 | 4 |
| 286.733337 | 30.01 | 45.11 | 32.20 | 73.42 | 6050 | 4 |
| 286.804199 | 30.97 | 42.15 | 37.28 | 74.41 | 6048 | 4 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|-----|
| 286.875031 | 33.00 | 41.65 | 39.02 | 74.59 | 6057 | 15 |
| 286.945831 | 41.61 | 50.69 | 43.78 | 90.76 | 6057 | 15 |
| 286.990601 | 54.09 | 62.28 | 63.07 | 114.53 | 1600 | 15 |
| 287.024933 | 39.55 | 68.95 | 69.52 | 123.02 | 4236 | 80 |
| 287.085388 | 60.49 | 99.63 | 118.78 | 187.54 | 6040 | 80 |
| 287.156250 | 52.54 | 98.83 | 103.89 | 172.95 | 6020 | 111 |
| 287.297913 | 46.15 | 48.23 | 44.79 | 91.68 | 6063 | 15 |
| 287.368713 | 36.54 | 52.09 | 49.01 | 90.32 | 6048 | 15 |
| 287.439606 | 33.46 | 50.96 | 52.09 | 91.43 | 6057 | 9 |
| 287.510406 | 34.75 | 53.39 | 48.93 | 91.22 | 6049 | 27 |
| 287.581268 | 35.05 | 65.25 | 47.25 | 98.75 | 6043 | 27 |
| 287.652100 | 34.18 | 53.58 | 54.82 | 98.10 | 6035 | 27 |
| 287.722931 | 35.31 | 62.20 | 56.31 | 105.48 | 6050 | 27 |
| 287.793762 | 35.51 | 56.53 | 58.57 | 102.51 | 6048 | 15 |
| 287.864594 | 34.59 | 57.33 | 61.15 | 105.75 | 6052 | 15 |
| 287.935425 | 43.51 | 65.53 | 67.48 | 118.94 | 6046 | 6 |
| 287.985443 | 56.46 | 70.11 | 69.31 | 127.85 | 2487 | 6 |
| 288.020172 | 41.26 | 57.40 | 60.25 | 109.36 | 3435 | 22 |
| 288.075623 | 54.66 | 84.50 | 77.41 | 142.72 | 6041 | 22 |
| 288.146515 | 47.01 | 89.07 | 81.30 | 147.76 | 6052 | 39 |
| 288.288300 | 51.49 | 114.29 | 86.20 | 174.58 | 6022 | 67 |
| 288.359009 | 39.00 | 111.42 | 82.63 | 163.73 | 6055 | 67 |
| 288.429871 | 42.21 | 107.10 | 77.12 | 159.76 | 6060 | 48 |
| 288.500671 | 41.40 | 80.17 | 76.46 | 134.42 | 6038 | 48 |
| 288.571503 | 46.89 | 111.90 | 79.85 | 164.98 | 6044 | 48 |
| 288.642365 | 48.50 | 96.17 | 83.64 | 157.97 | 6046 | 56 |
| 288.713226 | 53.45 | 99.35 | 92.41 | 163.25 | 6049 | 56 |
| 288.784027 | 48.66 | 79.03 | 82.96 | 141.01 | 6030 | 32 |
| 288.854889 | 43.21 | 53.04 | 58.25 | 106.75 | 6054 | 32 |
| 288.925751 | 47.85 | 68.36 | 60.92 | 120.56 | 6050 | 48 |
| 288.980530 | 56.42 | 69.98 | 57.14 | 126.43 | 3317 | 48 |
| 289.015289 | 41.09 | 61.25 | 32.31 | 89.69 | 2610 | 7 |
| 289.065948 | 51.47 | 68.19 | 45.84 | 108.44 | 6051 | 7 |
| 289.136780 | 50.56 | 73.35 | 50.43 | 113.54 | 6052 | 15 |
| 289.207611 | 47.36 | 72.08 | 34.15 | 101.30 | 6053 | 15 |
| 289.278473 | 46.02 | 48.43 | 21.04 | 75.98 | 6060 | 6 |
| 289.349304 | 37.04 | 42.51 | 20.43 | 68.82 | 6055 | 6 |
| 289.420135 | 32.49 | 42.27 | 20.71 | 65.48 | 6059 | 6 |
| 289.490967 | 35.62 | 47.31 | 24.54 | 71.37 | 6054 | 6 |
| 289.561768 | 38.57 | 51.62 | 30.97 | 81.92 | 6045 | 7 |
| 289.632629 | 37.59 | 54.59 | 26.20 | 80.51 | 6054 | 6 |
| 289.703491 | 36.68 | 51.67 | 36.59 | 85.62 | 6054 | 6 |
| 289.774323 | 37.89 | 55.11 | 33.67 | 85.92 | 6048 | 7 |
| 289.845154 | 35.41 | 47.13 | 42.17 | 85.15 | 6046 | 7 |
| 289.916016 | 39.02 | 50.81 | 50.42 | 94.54 | 6057 | 7 |
| 289.975708 | 47.63 | 54.29 | 47.44 | 98.93 | 4142 | 7 |
| 290.010406 | 30.34 | 51.68 | 29.32 | 74.21 | 1771 | 32 |
| 290.056274 | 52.16 | 84.58 | 70.21 | 136.43 | 6047 | 32 |
| 290.126801 | 50.06 | 76.63 | 41.99 | 111.56 | 5465 | 7 |
| 290.197968 | 45.29 | 58.99 | 28.46 | 85.99 | 6021 | 7 |
| 290.268707 | 45.41 | 46.27 | 21.63 | 74.53 | 6053 | 5 |
| 290.339569 | 36.29 | 47.06 | 20.19 | 70.73 | 6058 | 5 |
| 290.410400 | 30.43 | 44.27 | 25.62 | 68.29 | 6054 | 5 |
| 290.481262 | 32.58 | 43.23 | 23.28 | 67.65 | 6053 | 5 |
| 290.552094 | 36.72 | 48.82 | 27.91 | 76.25 | 6054 | 6 |
| 290.622925 | 37.54 | 50.54 | 26.13 | 77.66 | 6052 | 6 |
| 290.693787 | 35.41 | 53.60 | 47.42 | 91.48 | 6055 | 12 |
| 290.764587 | 35.24 | 49.87 | 44.82 | 86.72 | 6049 | 7 |
| 290.835419 | 35.13 | 41.18 | 35.82 | 75.14 | 6053 | 7 |
| 290.909241 | 39.79 | 52.62 | 44.04 | 91.57 | 5529 | 7 |
| 290.970825 | 43.89 | 44.78 | 36.79 | 82.52 | 4979 | 7 |
| 291.005219 | 38.78 | 47.52 | 11.03 | 65.18 | 892 | 15 |
| 291.045837 | 45.16 | 58.34 | 41.32 | 93.81 | 6051 | 15 |
| 291.116669 | 51.18 | 72.35 | 64.43 | 121.97 | 6055 | 15 |
| 291.187500 | 43.76 | 59.47 | 30.98 | 87.24 | 6061 | 15 |
| 291.258331 | 44.05 | 50.19 | 23.15 | 76.31 | 6061 | 7 |
| 291.329163 | 36.79 | 46.55 | 22.44 | 69.69 | 6052 | 7 |
| 291.399963 | 31.72 | 47.69 | 33.35 | 75.72 | 6050 | 7 |
| 291.470856 | 29.16 | 44.45 | 27.93 | 68.69 | 6054 | 7 |
| 291.541656 | 34.06 | 54.02 | 26.08 | 78.03 | 6053 | 7 |
| 291.610535 | 37.05 | 63.20 | 30.71 | 88.08 | 5427 | 7 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 291.683350 | 41.95 | 54.46 | 25.43 | 82.95 | 6053 | 7 |
| 291.754181 | 31.93 | 45.38 | 32.96 | 72.95 | 6050 | 15 |
| 291.825012 | 34.02 | 44.94 | 58.09 | 93.19 | 6050 | 15 |
| 291.895844 | 42.46 | 41.67 | 49.39 | 89.84 | 6054 | 12 |
| 291.965637 | 47.10 | 49.54 | 43.44 | 91.88 | 5875 | 12 |
| 292.000336 | 47.53 | 95.12 | 17.88 | 107.96 | 57 | 15 |
| 292.036102 | 53.02 | 56.25 | 38.99 | 98.59 | 6052 | 15 |
| 292.106934 | 55.19 | 58.72 | 40.48 | 100.83 | 6057 | 15 |
| 292.177765 | 50.65 | 62.95 | 46.04 | 103.24 | 6055 | 9 |
| 292.248596 | 50.07 | 61.38 | 30.94 | 93.37 | 6059 | 9 |
| 292.319458 | 45.35 | 47.76 | 23.05 | 77.42 | 6055 | 6 |
| 292.390289 | 38.61 | 48.38 | 27.75 | 75.52 | 6063 | 7 |
| 292.461121 | 37.64 | 56.17 | 39.14 | 89.28 | 6054 | 7 |
| 292.531921 | 40.05 | 56.15 | 41.07 | 91.75 | 6050 | 12 |
| 292.602753 | 37.22 | 57.23 | 43.56 | 92.16 | 6049 | 12 |
| 292.673615 | 39.66 | 49.58 | 33.55 | 81.62 | 6051 | 6 |
| 292.744446 | 30.97 | 43.66 | 37.82 | 75.70 | 6051 | 6 |
| 292.815277 | 32.93 | 49.24 | 39.45 | 81.68 | 6050 | 6 |
| 292.886108 | 39.64 | 55.24 | 48.94 | 94.08 | 6052 | 12 |
| 292.956970 | 48.47 | 54.45 | 42.89 | 95.29 | 6055 | 12 |
| 292.996185 | 25.55 | 52.61 | 23.12 | 71.66 | 654 | 12 |
| 293.030884 | 52.71 | 52.67 | 34.98 | 93.14 | 5273 | 12 |
| 293.097198 | 56.78 | 64.42 | 47.07 | 109.57 | 6055 | 12 |
| 293.168030 | 47.29 | 61.30 | 33.13 | 92.43 | 6051 | 12 |
| 293.238892 | 48.53 | 57.04 | 28.87 | 87.72 | 6060 | 12 |
| 293.309723 | 43.79 | 65.22 | 28.10 | 93.65 | 6052 | 9 |
| 293.380554 | 37.76 | 51.47 | 29.26 | 80.14 | 6058 | 7 |
| 293.451385 | 31.63 | 51.93 | 26.91 | 76.44 | 6057 | 7 |
| 293.522186 | 34.13 | 54.77 | 32.43 | 81.89 | 6052 | 15 |
| 293.593079 | 37.03 | 57.26 | 31.22 | 85.91 | 6011 | 15 |
| 293.663879 | 37.99 | 55.65 | 31.36 | 85.59 | 6051 | 5 |
| 293.734711 | 30.52 | 45.95 | 31.46 | 73.32 | 6046 | 5 |
| 293.805573 | 30.75 | 50.26 | 33.81 | 77.51 | 6051 | 5 |
| 293.876404 | 31.55 | 42.45 | 40.64 | 75.30 | 6058 | 7 |
| 293.947235 | 38.41 | 46.32 | 34.47 | 78.67 | 6055 | 7 |
| 293.991302 | 55.08 | 46.33 | 45.88 | 95.34 | 1482 | 7 |
| 294.026093 | 35.62 | 51.35 | 26.67 | 76.69 | 4438 | 3 |
| 294.087494 | 41.35 | 57.08 | 41.34 | 92.35 | 6055 | 3 |
| 294.158325 | 40.44 | 54.94 | 38.90 | 88.12 | 6049 | 4 |
| 294.299988 | 36.72 | 45.81 | 41.50 | 80.01 | 6052 | 2 |
| 294.370819 | 29.34 | 41.27 | 43.55 | 76.22 | 6059 | 2 |
| 294.441681 | 26.57 | 44.33 | 45.67 | 78.43 | 6058 | 3 |
| 294.512512 | 29.70 | 48.27 | 44.43 | 82.43 | 6053 | 2 |
| 294.583282 | 34.71 | 53.46 | 45.12 | 89.15 | 6052 | 2 |
| 294.654144 | 33.29 | 50.26 | 45.63 | 87.72 | 6053 | 3 |
| 294.725037 | 31.85 | 44.88 | 48.73 | 86.25 | 6054 | 3 |
| 294.795868 | 32.86 | 48.69 | 47.56 | 88.70 | 6053 | 4 |
| 294.866638 | 32.30 | 50.18 | 43.25 | 85.54 | 6038 | 4 |
| 294.937439 | 35.38 | 47.54 | 46.73 | 88.28 | 6045 | 2 |
| 294.986450 | 49.94 | 59.32 | 63.05 | 113.58 | 2312 | 2 |
| 295.020844 | 28.52 | 47.69 | 33.76 | 76.28 | 3557 | 2 |
| 295.077057 | 40.63 | 55.82 | 44.21 | 93.31 | 6057 | 2 |
| 295.147949 | 36.79 | 63.29 | 40.04 | 93.67 | 6046 | 0 |
| 295.289581 | 35.25 | 40.86 | 37.82 | 74.10 | 6062 | 2 |
| 295.360413 | 28.67 | 41.36 | 39.95 | 73.31 | 6060 | 2 |
| 295.431274 | 25.46 | 43.78 | 43.95 | 75.89 | 6056 | 3 |
| 295.502075 | 29.35 | 49.75 | 44.01 | 82.26 | 6057 | 6 |
| 295.572906 | 33.12 | 57.01 | 43.18 | 91.50 | 6053 | 6 |
| 295.643738 | 33.95 | 49.65 | 43.37 | 86.79 | 6051 | 5 |
| 295.714569 | 32.65 | 46.07 | 44.41 | 85.22 | 6044 | 5 |
| 295.785431 | 34.26 | 43.55 | 47.54 | 86.59 | 6051 | 4 |
| 295.856262 | 31.10 | 46.73 | 46.50 | 83.30 | 6041 | 4 |
| 295.927124 | 33.20 | 47.39 | 47.87 | 86.46 | 6048 | 2 |
| 295.981232 | 40.86 | 50.39 | 47.20 | 92.40 | 3201 | 2 |
| 296.016022 | 29.16 | 48.78 | 25.33 | 72.40 | 2727 | 3 |
| 296.067352 | 36.77 | 55.15 | 33.52 | 83.63 | 6045 | 3 |
| 296.138184 | 34.26 | 61.46 | 32.68 | 85.70 | 6059 | 3 |
| 296.209076 | 37.09 | 54.45 | 25.51 | 77.20 | 6048 | 3 |
| 296.279846 | 33.10 | 47.76 | 20.16 | 66.92 | 6061 | 7 |
| 296.350708 | 25.79 | 50.56 | 26.81 | 69.46 | 6055 | 7 |
| 296.421539 | 26.85 | 50.16 | 26.87 | 69.77 | 6052 | 15 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 296.492371 | 31.90 | 62.05 | 48.34 | 96.87 | 6053 | 15 |
| 296.563171 | 33.89 | 58.92 | 57.36 | 101.91 | 6041 | 18 |
| 296.634033 | 34.22 | 60.02 | 56.50 | 101.09 | 6055 | 39 |
| 296.704865 | 36.47 | 54.47 | 55.01 | 98.52 | 6030 | 39 |
| 296.775757 | 44.60 | 78.18 | 87.61 | 143.98 | 6028 | 32 |
| 296.846527 | 36.57 | 79.28 | 58.66 | 121.73 | 6035 | 32 |
| 296.916687 | 40.60 | 57.67 | 53.43 | 101.70 | 5874 | 12 |
| 296.976349 | 51.01 | 63.00 | 75.80 | 127.24 | 4022 | 12 |
| 297.011078 | 39.22 | 61.28 | 54.14 | 106.65 | 1898 | 27 |
| 297.057617 | 49.79 | 67.99 | 47.51 | 108.67 | 6053 | 27 |
| 297.128448 | 43.77 | 67.18 | 39.16 | 99.02 | 6049 | 18 |
| 297.199310 | 46.03 | 60.49 | 36.74 | 92.72 | 6030 | 18 |
| 297.270111 | 45.85 | 72.52 | 57.56 | 117.67 | 6055 | 22 |
| 297.340942 | 39.24 | 57.87 | 40.63 | 92.09 | 6058 | 22 |
| 297.412048 | 33.60 | 49.93 | 39.62 | 84.17 | 5983 | 22 |
| 297.482635 | 33.48 | 53.61 | 61.34 | 99.66 | 6052 | 22 |
| 297.553467 | 35.71 | 51.31 | 36.31 | 82.60 | 6051 | 9 |
| 297.624298 | 37.12 | 50.67 | 27.90 | 78.13 | 6055 | 9 |
| 297.695221 | 35.76 | 53.57 | 25.18 | 77.68 | 6043 | 6 |
| 297.765991 | 34.21 | 50.78 | 30.27 | 77.05 | 6049 | 7 |
| 297.836792 | 33.39 | 42.93 | 33.08 | 73.36 | 6049 | 7 |
| 297.907654 | 39.61 | 47.03 | 44.20 | 85.71 | 6059 | 9 |
| 297.971466 | 50.65 | 54.53 | 52.89 | 104.47 | 4851 | 9 |
| 298.005920 | 42.09 | 46.86 | 9.89 | 66.23 | 1008 | 9 |
| 298.047211 | 49.36 | 67.33 | 39.01 | 102.04 | 6043 | 9 |
| 298.118042 | 51.39 | 59.65 | 45.32 | 101.88 | 6045 | 9 |
| 298.188904 | 46.89 | 51.80 | 29.88 | 83.48 | 6048 | 6 |
| 298.259735 | 47.31 | 51.20 | 21.22 | 77.86 | 6063 | 9 |
| 298.330536 | 37.80 | 72.52 | 36.53 | 102.27 | 6056 | 9 |
| 298.401367 | 31.72 | 67.22 | 63.81 | 110.55 | 6050 | 18 |
| 298.472198 | 36.22 | 61.33 | 72.84 | 112.97 | 6047 | 18 |
| 298.543030 | 37.74 | 58.57 | 47.97 | 96.82 | 6051 | 12 |
| 298.613892 | 36.77 | 53.99 | 29.79 | 82.47 | 6055 | 12 |
| 298.684723 | 38.91 | 50.50 | 27.43 | 79.22 | 6050 | 5 |
| 298.755585 | 33.53 | 50.60 | 37.81 | 80.78 | 6047 | 6 |
| 298.826416 | 32.43 | 45.46 | 35.13 | 75.95 | 6053 | 6 |
| 298.897247 | 38.24 | 45.09 | 41.51 | 82.18 | 6061 | 6 |
| 298.966339 | 46.44 | 48.47 | 43.75 | 90.97 | 5757 | 6 |
| 299.001068 | 43.45 | 92.81 | 23.08 | 105.37 | 176 | 2 |
| 299.037445 | 49.39 | 55.43 | 45.55 | 99.55 | 6044 | 2 |
| 299.108307 | 47.38 | 63.97 | 48.51 | 104.76 | 6051 | 2 |
| 299.179169 | 44.41 | 53.75 | 39.56 | 89.46 | 6050 | 3 |
| 299.249969 | 45.95 | 46.10 | 41.12 | 85.42 | 6057 | 3 |
| 299.320801 | 38.71 | 59.00 | 42.59 | 92.59 | 6057 | 7 |
| 299.391663 | 32.90 | 57.40 | 55.82 | 97.53 | 6053 | 7 |
| 299.462524 | 30.52 | 60.08 | 56.79 | 99.01 | 6053 | 7 |
| 299.533325 | 39.44 | 61.48 | 70.65 | 113.66 | 6048 | 12 |
| 299.604156 | 38.84 | 63.69 | 51.28 | 103.67 | 6052 | 12 |
| 299.674988 | 38.93 | 55.24 | 40.24 | 91.46 | 6050 | 4 |
| 299.821777 | 34.01 | 49.11 | 50.18 | 92.96 | 5181 | 6 |
| 299.887604 | 34.75 | 45.72 | 54.44 | 93.38 | 6045 | 7 |
| 299.958313 | 43.93 | 52.33 | 56.14 | 102.33 | 6040 | 7 |
| 299.996857 | 23.04 | 63.13 | 74.32 | 111.13 | 532 | 7 |
| 300.031586 | 51.24 | 56.89 | 52.73 | 104.07 | 5390 | 12 |
| 300.098663 | 51.39 | 64.10 | 49.32 | 105.99 | 5970 | 12 |
| 300.169464 | 43.68 | 83.66 | 46.80 | 116.82 | 6054 | 9 |
| 300.240265 | 42.47 | 84.97 | 37.69 | 114.56 | 6052 | 9 |
| 300.311127 | 39.84 | 84.30 | 33.38 | 111.99 | 6064 | 7 |
| 300.381958 | 34.09 | 63.94 | 36.06 | 90.53 | 6058 | 7 |
| 300.452789 | 30.98 | 58.01 | 38.75 | 85.49 | 6058 | 7 |
| 300.523621 | 34.86 | 60.55 | 50.57 | 97.81 | 6051 | 7 |
| 300.594421 | 37.14 | 56.91 | 34.72 | 86.82 | 6055 | 7 |
| 300.665283 | 34.76 | 50.09 | 34.51 | 81.34 | 6050 | 4 |
| 300.736145 | 29.59 | 49.68 | 32.90 | 76.31 | 6052 | 4 |
| 300.806976 | 31.30 | 47.51 | 33.34 | 74.20 | 6051 | 6 |
| 300.877808 | 32.48 | 49.04 | 44.40 | 83.21 | 6057 | 9 |
| 300.948639 | 43.23 | 51.15 | 52.34 | 98.63 | 6059 | 9 |
| 300.992004 | 52.67 | 52.78 | 41.72 | 96.19 | 1362 | 9 |
| 301.026794 | 42.15 | 53.12 | 48.12 | 95.40 | 4566 | 9 |
| 301.088898 | 47.80 | 59.57 | 38.09 | 95.80 | 6054 | 9 |
| 301.159729 | 50.27 | 56.32 | 26.51 | 92.69 | 6062 | 2 |

| | | | | | | |
|------------|--------|--------|-------|--------|------|----|
| 301.230530 | 52.99 | 107.62 | 55.59 | 155.37 | 6055 | 2 |
| 301.301392 | 117.05 | 245.05 | 49.39 | 299.32 | 6062 | 5 |
| 301.372223 | 65.24 | 74.90 | 40.28 | 126.19 | 6056 | 5 |
| 301.443054 | 30.32 | 53.33 | 50.02 | 91.98 | 6055 | 5 |
| 301.513885 | 33.99 | 51.09 | 42.38 | 83.76 | 6052 | 4 |
| 301.584747 | 37.59 | 57.63 | 22.16 | 82.06 | 6053 | 4 |
| 301.655579 | 37.41 | 56.82 | 24.68 | 82.24 | 6055 | 4 |
| 301.726410 | 33.62 | 53.65 | 25.46 | 76.70 | 6054 | 4 |
| 301.796234 | 32.55 | 53.19 | 17.30 | 72.44 | 5407 | 3 |
| 301.868805 | 36.30 | 51.37 | 17.82 | 74.44 | 5906 | 3 |
| 301.938904 | 42.73 | 50.96 | 20.14 | 79.07 | 6059 | 4 |
| 301.987152 | 50.17 | 73.30 | 38.83 | 112.25 | 2190 | 4 |
| 302.021545 | 44.41 | 44.29 | 32.19 | 80.08 | 3677 | 3 |
| 302.078339 | 48.29 | 60.68 | 30.77 | 95.84 | 6006 | 3 |
| 302.149292 | 42.39 | 59.83 | 30.01 | 90.75 | 6063 | 3 |
| 302.220184 | 44.14 | 62.47 | 29.24 | 93.47 | 6036 | 3 |
| 302.290985 | 41.15 | 66.07 | 27.05 | 93.05 | 6062 | 9 |
| 302.361816 | 33.96 | 60.69 | 24.39 | 81.64 | 6057 | 9 |
| 302.432617 | 33.43 | 79.68 | 58.45 | 121.16 | 6027 | 39 |
| 302.503510 | 33.54 | 57.21 | 53.17 | 96.47 | 6040 | 27 |
| 302.574249 | 35.21 | 70.00 | 58.07 | 111.29 | 6046 | 27 |
| 302.645111 | 35.80 | 59.39 | 45.65 | 96.40 | 6041 | 9 |
| 302.716003 | 34.68 | 59.05 | 27.76 | 83.78 | 6049 | 9 |
| 302.786804 | 30.90 | 56.69 | 32.58 | 81.53 | 6047 | 15 |
| 302.857635 | 29.78 | 57.00 | 37.45 | 87.22 | 6044 | 15 |
| 302.928497 | 40.45 | 71.19 | 41.47 | 109.93 | 6058 | 56 |
| 302.981934 | 57.71 | 81.83 | 39.22 | 122.25 | 3073 | 56 |
| 303.016693 | 44.90 | 118.57 | 91.88 | 174.74 | 2831 | 80 |
| 303.068787 | 63.14 | 117.00 | 89.01 | 180.02 | 6035 | 80 |
| 303.139557 | 61.73 | 106.28 | 90.22 | 168.90 | 6038 | 80 |
| 303.210419 | 53.85 | 130.24 | 81.63 | 177.84 | 6059 | 80 |
| 303.281250 | 53.58 | 113.75 | 68.41 | 157.88 | 6052 | 22 |
| 303.352081 | 40.79 | 110.70 | 68.22 | 153.68 | 6052 | 22 |
| 303.422913 | 37.50 | 104.30 | 72.89 | 152.90 | 6055 | 27 |
| 303.493744 | 40.24 | 75.19 | 56.43 | 117.18 | 6045 | 27 |
| 303.564575 | 45.47 | 72.13 | 60.31 | 122.19 | 6050 | 15 |
| 303.635406 | 45.47 | 72.65 | 72.77 | 133.22 | 6051 | 18 |
| 303.706268 | 49.62 | 87.03 | 63.79 | 136.00 | 6055 | 18 |
| 303.777100 | 44.07 | 83.37 | 61.02 | 126.65 | 6047 | 18 |
| 303.847931 | 42.39 | 72.70 | 61.53 | 119.28 | 6053 | 18 |
| 303.918793 | 46.08 | 68.25 | 41.45 | 106.72 | 6053 | 12 |
| 303.977051 | 53.21 | 66.58 | 33.49 | 106.01 | 3908 | 12 |
| 304.011810 | 42.45 | 65.10 | 70.67 | 123.11 | 2020 | 48 |
| 304.058990 | 52.30 | 81.37 | 50.16 | 122.63 | 6050 | 48 |
| 304.129852 | 53.29 | 88.67 | 57.65 | 133.13 | 6056 | 22 |
| 304.200684 | 50.47 | 60.28 | 34.21 | 95.02 | 6060 | 22 |
| 304.271515 | 48.12 | 58.34 | 27.70 | 90.40 | 6060 | 12 |
| 304.342377 | 37.48 | 62.70 | 28.65 | 89.38 | 6055 | 12 |
| 304.413177 | 34.83 | 86.40 | 50.36 | 120.41 | 6054 | 18 |
| 304.484009 | 34.11 | 59.92 | 37.58 | 87.07 | 6055 | 18 |
| 304.554840 | 36.23 | 61.56 | 36.22 | 88.93 | 6054 | 6 |
| 304.625702 | 37.30 | 73.90 | 42.92 | 105.99 | 6041 | 7 |
| 304.696564 | 33.91 | 53.47 | 36.06 | 86.39 | 6051 | 7 |
| 304.767365 | 33.43 | 55.86 | 46.70 | 93.12 | 6051 | 6 |
| 304.838226 | 33.17 | 53.64 | 49.17 | 92.86 | 6055 | 6 |
| 304.909119 | 40.13 | 48.71 | 53.14 | 94.80 | 6045 | 4 |
| 304.972229 | 45.80 | 49.06 | 54.59 | 99.67 | 4743 | 4 |

APPENDIX E. LATE CALIBRATION ORBITAL RESULTS FOR NON-AURORAL DATA

The columns of data below have the following format from left to right, where an orbit is defined only as a 6120second period:

1. Average decimal day of year 2000 of the field vector in this orbit.
2. Orbital average difference from zero of measured-minus-modeled field for non-auroral (automated clipping) X (down) components in nT.
3. Orbital average difference from zero of measured-minus-modeled field for non-auroral (automated clipping) Y (velocity) components in nT.
4. Orbital average difference from zero of measured-minus-modeled field for non-auroral (automated clipping) Z (orbit normal) components in nT.
5. Orbital average magnitude of differences from zero of measured-minus-modeled field for non-auroral (automated clipping) components in nT.
6. Number of vectors contributing to these averages.
7. Three hour Ap most closely corresponding to the value in column 1.

| | | | | | | |
|----------|-------|-------|--------|--------|------|----|
| 5.027755 | 33.63 | 70.98 | 167.65 | 196.34 | 3416 | 27 |
| 5.090914 | 32.72 | 61.49 | 192.01 | 214.74 | 4006 | 27 |
| 5.161644 | 27.85 | 68.56 | 193.97 | 215.23 | 4083 | 18 |
| 5.231574 | 26.59 | 60.37 | 185.80 | 203.96 | 4256 | 18 |
| 5.371875 | 19.12 | 58.44 | 192.73 | 208.27 | 4425 | 18 |
| 5.522280 | 15.53 | 61.94 | 166.72 | 185.99 | 3373 | 9 |
| 5.585544 | 20.19 | 53.13 | 187.50 | 208.56 | 4316 | 9 |
| 5.733137 | 22.82 | 44.97 | 168.25 | 186.89 | 3318 | 15 |
| 5.796366 | 24.62 | 45.60 | 176.32 | 194.08 | 4280 | 22 |
| 5.868137 | 23.48 | 47.02 | 178.71 | 198.77 | 4451 | 22 |
| 5.987731 | 35.82 | 68.63 | 222.54 | 247.92 | 1284 | 27 |
| 6.021586 | 33.40 | 43.27 | 25.41 | 69.05 | 2946 | 12 |
| 6.081134 | 30.33 | 47.31 | 20.14 | 65.36 | 4024 | 12 |
| 6.151979 | 26.75 | 45.76 | 21.15 | 62.91 | 4072 | 18 |
| 6.221979 | 25.59 | 41.12 | 17.76 | 56.52 | 4221 | 18 |
| 6.291921 | 21.88 | 38.62 | 13.24 | 50.67 | 4378 | 7 |
| 6.362211 | 16.09 | 35.95 | 16.83 | 48.50 | 4430 | 7 |
| 6.432755 | 15.53 | 31.11 | 14.23 | 43.70 | 4341 | 18 |
| 6.503449 | 16.03 | 38.84 | 23.21 | 55.73 | 4239 | 32 |
| 6.575764 | 21.78 | 63.37 | 49.35 | 92.02 | 4341 | 32 |
| 6.646678 | 18.19 | 71.68 | 46.28 | 95.58 | 4140 | 32 |
| 6.716123 | 19.79 | 44.16 | 32.59 | 69.17 | 4096 | 32 |
| 6.786632 | 25.98 | 43.74 | 21.84 | 64.15 | 4267 | 15 |
| 6.858113 | 22.56 | 46.83 | 23.61 | 65.30 | 4415 | 15 |
| 6.929884 | 27.27 | 46.92 | 31.65 | 72.78 | 4615 | 18 |
| 6.983414 | 30.91 | 50.80 | 27.50 | 71.87 | 2269 | 18 |
| 7.018299 | 25.05 | 42.25 | 21.28 | 61.89 | 2143 | 18 |
| 7.070984 | 25.31 | 48.13 | 26.12 | 66.21 | 4076 | 18 |
| 7.142245 | 22.56 | 46.77 | 18.78 | 60.04 | 4055 | 15 |
| 7.212361 | 21.00 | 39.63 | 14.52 | 52.27 | 4201 | 15 |
| 7.282292 | 20.40 | 37.09 | 15.22 | 50.56 | 4351 | 5 |
| 7.352558 | 14.98 | 36.32 | 20.60 | 50.59 | 4430 | 5 |
| 7.423032 | 13.81 | 35.28 | 17.95 | 47.76 | 4374 | 7 |
| 7.493669 | 17.11 | 37.42 | 18.97 | 50.76 | 4259 | 7 |
| 7.565949 | 22.42 | 46.11 | 15.72 | 59.53 | 4359 | 7 |
| 7.637303 | 22.78 | 48.42 | 19.77 | 62.43 | 4058 | 9 |
| 7.706539 | 24.09 | 43.73 | 23.95 | 61.58 | 4043 | 9 |
| 7.776817 | 25.72 | 43.81 | 23.97 | 63.02 | 4250 | 12 |
| 7.848148 | 22.33 | 46.49 | 22.16 | 63.37 | 4340 | 12 |
| 7.919977 | 26.58 | 43.41 | 28.70 | 66.24 | 4602 | 7 |
| 7.978125 | 24.31 | 49.65 | 23.73 | 66.34 | 2927 | 7 |

| | | | | | | |
|-----------|-------|-------|--------|--------|------|----|
| 8.014664 | 37.87 | 33.63 | 100.20 | 123.70 | 1506 | 7 |
| 8.060683 | 25.84 | 52.68 | 167.57 | 185.55 | 4176 | 7 |
| 8.132593 | 24.11 | 48.97 | 176.43 | 191.32 | 4029 | 3 |
| 8.202755 | 22.42 | 46.13 | 176.29 | 189.23 | 4185 | 3 |
| 8.272639 | 21.95 | 42.15 | 175.00 | 186.42 | 4333 | 5 |
| 8.413299 | 14.38 | 41.95 | 172.37 | 181.74 | 4400 | 6 |
| 8.483993 | 16.58 | 43.86 | 165.67 | 178.35 | 4268 | 6 |
| 8.556134 | 23.04 | 53.25 | 167.27 | 187.39 | 4381 | 6 |
| 8.627315 | 23.70 | 51.13 | 171.38 | 190.58 | 4208 | 9 |
| 8.774664 | 21.29 | 40.82 | 154.23 | 172.38 | 3380 | 3 |
| 8.838194 | 22.02 | 39.04 | 164.49 | 179.77 | 4299 | 3 |
| 8.974074 | 32.21 | 50.02 | 172.03 | 192.91 | 2809 | 0 |
| 9.007431 | 41.88 | 33.25 | 49.06 | 78.30 | 1226 | 5 |
| 9.050741 | 30.52 | 48.73 | 57.55 | 89.24 | 4196 | 5 |
| 9.122894 | 35.07 | 47.25 | 59.89 | 93.01 | 4036 | 5 |
| 9.193194 | 28.57 | 43.42 | 61.83 | 87.75 | 4146 | 5 |
| 9.263044 | 26.94 | 40.17 | 66.02 | 87.79 | 4314 | 0 |
| 9.333252 | 18.64 | 35.14 | 65.21 | 81.69 | 4380 | 0 |
| 9.626736 | 21.12 | 43.59 | 58.28 | 82.69 | 3249 | 2 |
| 9.687512 | 15.89 | 40.98 | 67.32 | 87.29 | 3918 | 2 |
| 9.834745 | 22.25 | 40.12 | 55.25 | 79.76 | 3549 | 2 |
| 9.900174 | 28.90 | 40.76 | 64.23 | 89.63 | 4510 | 6 |
| 9.967708 | 31.11 | 42.73 | 63.99 | 90.78 | 4059 | 6 |
| 10.002442 | 43.04 | 34.14 | 55.42 | 83.43 | 414 | 5 |
| 10.040741 | 35.20 | 51.60 | 155.89 | 176.19 | 4247 | 5 |
| 10.118715 | 38.81 | 59.19 | 152.28 | 177.11 | 3437 | 5 |
| 10.183507 | 29.62 | 53.17 | 166.00 | 183.96 | 4146 | 7 |
| 10.253437 | 27.30 | 50.45 | 166.94 | 182.30 | 4300 | 3 |
| 10.323438 | 20.81 | 46.54 | 161.53 | 174.74 | 4371 | 3 |
| 10.393889 | 19.82 | 44.64 | 162.94 | 174.28 | 4407 | 3 |
| 10.464525 | 18.91 | 46.11 | 157.93 | 170.76 | 4304 | 3 |
| 10.536447 | 20.94 | 50.91 | 162.07 | 178.61 | 4378 | 4 |
| 10.607824 | 21.89 | 49.15 | 167.26 | 182.47 | 4255 | 4 |
| 10.678183 | 17.63 | 40.50 | 171.71 | 182.12 | 3998 | 6 |
| 10.966215 | 33.79 | 54.82 | 147.90 | 176.02 | 4073 | 15 |
| 10.997824 | 21.56 | 51.96 | 138.65 | 151.39 | 223 | 15 |
| 11.136644 | 28.30 | 62.89 | 9.52 | 69.64 | 27 | 9 |
| 11.173958 | 32.42 | 45.66 | 20.08 | 66.04 | 4106 | 9 |
| 11.243762 | 29.36 | 41.95 | 10.99 | 56.78 | 4268 | 9 |
| 11.313704 | 24.21 | 39.78 | 15.99 | 54.13 | 4365 | 6 |
| 11.384225 | 21.10 | 34.97 | 10.73 | 46.84 | 4419 | 9 |
| 11.454792 | 20.97 | 35.26 | 12.70 | 49.31 | 4332 | 9 |
| 11.526597 | 20.81 | 45.24 | 21.43 | 62.32 | 4381 | 22 |
| 11.598044 | 19.66 | 63.93 | 27.95 | 81.76 | 4290 | 22 |
| 11.668623 | 18.48 | 48.81 | 19.38 | 61.62 | 4060 | 22 |
| 11.738113 | 22.64 | 45.94 | 32.19 | 73.45 | 4159 | 22 |
| 11.808843 | 31.20 | 71.30 | 58.52 | 114.33 | 4288 | 56 |
| 11.880625 | 30.76 | 81.82 | 56.50 | 123.17 | 4492 | 56 |
| 11.952269 | 37.60 | 85.59 | 57.62 | 123.38 | 4611 | 56 |
| 11.990984 | 36.62 | 79.89 | 26.53 | 104.40 | 709 | 56 |
| 12.029028 | 39.46 | 72.55 | 36.58 | 100.83 | 3572 | 22 |
| 12.093634 | 42.66 | 63.61 | 50.76 | 101.49 | 4004 | 22 |
| 12.164306 | 36.54 | 59.96 | 46.46 | 92.72 | 4087 | 15 |
| 12.234213 | 37.27 | 58.18 | 52.73 | 95.82 | 4256 | 15 |
| 12.304213 | 30.14 | 48.56 | 50.09 | 84.69 | 4402 | 12 |
| 12.374572 | 26.44 | 51.05 | 51.47 | 85.28 | 4426 | 12 |
| 12.445139 | 21.70 | 50.22 | 46.76 | 80.31 | 4312 | 7 |
| 12.516574 | 21.83 | 51.69 | 52.56 | 85.38 | 4348 | 4 |
| 12.660475 | 22.05 | 45.45 | 49.53 | 81.03 | 3524 | 7 |
| 12.728414 | 21.49 | 45.07 | 47.96 | 81.86 | 4140 | 7 |
| 12.799097 | 25.95 | 43.15 | 45.93 | 80.42 | 4274 | 9 |
| 12.871157 | 29.55 | 45.91 | 51.46 | 87.10 | 4404 | 9 |
| 12.942442 | 36.83 | 54.11 | 50.89 | 93.94 | 4626 | 7 |
| 12.986690 | 40.64 | 53.74 | 65.05 | 106.81 | 1190 | 7 |
| 13.022639 | 41.09 | 56.24 | 23.45 | 81.97 | 3171 | 7 |
| 13.083819 | 44.90 | 48.83 | 21.99 | 76.49 | 4015 | 7 |
| 13.154641 | 39.57 | 50.13 | 20.00 | 72.63 | 4082 | 9 |
| 13.224630 | 36.10 | 45.87 | 13.34 | 65.44 | 4225 | 9 |
| 13.294595 | 30.30 | 42.71 | 13.86 | 60.20 | 4385 | 9 |
| 13.364907 | 24.27 | 41.03 | 19.24 | 57.54 | 4432 | 9 |
| 13.435440 | 24.90 | 37.25 | 15.92 | 54.17 | 4332 | 15 |

| | | | | | | |
|-----------|-------|-------|--------|--------|------|----|
| 13.505949 | 19.81 | 43.91 | 23.19 | 59.91 | 4188 | 9 |
| 13.578715 | 19.06 | 53.00 | 20.56 | 66.33 | 4281 | 9 |
| 13.649306 | 16.30 | 51.00 | 20.59 | 62.24 | 4095 | 12 |
| 13.719109 | 18.42 | 43.10 | 25.46 | 58.91 | 4047 | 12 |
| 13.789317 | 24.76 | 43.01 | 21.18 | 60.63 | 4269 | 4 |
| 13.860810 | 22.98 | 42.86 | 19.02 | 60.33 | 4428 | 4 |
| 13.922095 | 27.79 | 55.50 | 29.11 | 77.82 | 3337 | 6 |
| 13.987211 | 31.87 | 49.67 | 14.94 | 67.10 | 1708 | 6 |
| 14.019086 | 23.77 | 63.59 | 46.45 | 91.98 | 2375 | 15 |
| 14.073947 | 26.15 | 47.25 | 62.00 | 90.29 | 4036 | 15 |
| 14.144942 | 23.52 | 47.19 | 63.40 | 89.73 | 4062 | 9 |
| 14.215035 | 23.51 | 39.68 | 65.23 | 86.56 | 4201 | 9 |
| 14.284954 | 21.41 | 38.14 | 66.08 | 85.41 | 4360 | 4 |
| 14.355243 | 15.51 | 34.87 | 66.27 | 81.57 | 4432 | 4 |
| 14.425694 | 13.46 | 35.68 | 65.40 | 80.69 | 4368 | 3 |
| 14.496354 | 15.84 | 38.55 | 67.66 | 84.93 | 4251 | 3 |
| 14.568646 | 21.43 | 50.63 | 64.83 | 94.40 | 4354 | 6 |
| 14.856586 | 21.05 | 41.30 | 61.68 | 88.18 | 3673 | 9 |
| 14.891273 | 27.68 | 43.16 | 93.79 | 114.20 | 758 | 6 |
| 15.035949 | 17.06 | 61.72 | 67.38 | 94.63 | 155 | 7 |
| 15.135220 | 24.08 | 47.21 | 76.95 | 100.58 | 4034 | 7 |
| 15.205417 | 23.45 | 41.47 | 79.12 | 98.62 | 4190 | 7 |
| 15.275336 | 22.66 | 38.38 | 79.97 | 97.34 | 4340 | 5 |
| 15.345567 | 16.23 | 34.96 | 77.04 | 91.36 | 4411 | 5 |
| 15.415995 | 14.81 | 34.63 | 78.12 | 91.21 | 4393 | 3 |
| 15.486655 | 16.97 | 39.35 | 75.50 | 92.89 | 4264 | 3 |
| 15.558866 | 21.68 | 45.25 | 74.84 | 97.67 | 4374 | 7 |
| 15.629977 | 19.85 | 48.10 | 80.64 | 102.88 | 4207 | 5 |
| 15.670289 | 23.74 | 49.90 | 117.65 | 133.71 | 968 | 5 |
| 16.010197 | 31.05 | 36.14 | 130.20 | 146.54 | 1226 | 5 |
| 16.053461 | 29.85 | 55.12 | 178.27 | 198.11 | 4199 | 5 |
| 16.125557 | 29.12 | 52.19 | 190.30 | 207.25 | 4028 | 4 |
| 16.265730 | 24.28 | 50.24 | 187.48 | 200.97 | 4322 | 5 |
| 16.335810 | 16.99 | 45.08 | 180.32 | 191.28 | 4390 | 5 |
| 16.406307 | 16.29 | 47.89 | 181.98 | 192.92 | 4396 | 5 |
| 16.629108 | 19.89 | 48.08 | 172.21 | 187.55 | 3277 | 6 |
| 16.767244 | 21.80 | 40.10 | 174.38 | 189.52 | 3406 | 6 |
| 16.831076 | 21.38 | 37.67 | 179.88 | 194.58 | 4277 | 6 |
| 16.902893 | 24.24 | 46.49 | 173.32 | 192.65 | 4518 | 7 |
| 16.968472 | 28.22 | 57.81 | 185.77 | 209.35 | 3805 | 7 |
| 17.003832 | 40.53 | 30.10 | 57.03 | 83.76 | 651 | 5 |
| 17.115845 | 33.86 | 49.61 | 103.17 | 128.13 | 4023 | 5 |
| 17.186146 | 28.48 | 45.44 | 106.08 | 126.27 | 4153 | 2 |
| 17.256111 | 27.46 | 45.06 | 105.31 | 123.92 | 4305 | 4 |
| 17.396631 | 18.24 | 39.53 | 103.34 | 116.81 | 4404 | 2 |
| 17.467245 | 17.70 | 40.06 | 100.50 | 115.26 | 4297 | 2 |
| 17.539202 | 20.66 | 44.89 | 105.81 | 123.69 | 4388 | 3 |
| 17.610485 | 20.98 | 46.01 | 105.69 | 124.49 | 4245 | 3 |
| 17.680695 | 16.12 | 41.99 | 104.44 | 120.61 | 3968 | 2 |
| 17.750441 | 20.31 | 39.67 | 102.89 | 120.65 | 4206 | 3 |
| 17.821365 | 21.26 | 38.82 | 92.02 | 110.83 | 4279 | 3 |
| 17.893171 | 23.08 | 41.03 | 96.88 | 115.76 | 4513 | 0 |
| 17.964733 | 29.82 | 45.14 | 87.24 | 111.77 | 4591 | 0 |
| 17.999641 | 21.32 | 50.61 | 29.58 | 63.05 | 59 | 0 |
| 18.005360 | 16.33 | 54.37 | 67.95 | 90.20 | 169 | 2 |
| 18.106089 | 40.92 | 51.04 | 95.96 | 125.87 | 4019 | 2 |
| 18.176598 | 33.62 | 56.19 | 124.31 | 148.34 | 4115 | 2 |
| 18.246492 | 33.31 | 47.30 | 109.27 | 129.74 | 4285 | 2 |
| 18.316366 | 24.50 | 43.47 | 112.12 | 128.73 | 4356 | 3 |
| 18.457546 | 22.12 | 46.41 | 106.28 | 123.66 | 4321 | 3 |
| 18.522362 | 20.76 | 47.87 | 98.75 | 121.29 | 3561 | 4 |
| 18.609608 | 19.37 | 51.90 | 99.65 | 124.48 | 3327 | 4 |
| 18.671272 | 18.62 | 41.55 | 109.66 | 128.41 | 4042 | 5 |
| 18.740788 | 18.15 | 36.30 | 105.59 | 121.86 | 4174 | 5 |
| 18.811539 | 24.43 | 36.29 | 107.82 | 126.97 | 4284 | 3 |
| 18.883368 | 30.41 | 41.81 | 103.46 | 127.41 | 4502 | 3 |
| 18.955000 | 38.09 | 47.71 | 107.54 | 135.83 | 4622 | 3 |
| 18.993786 | 23.55 | 42.88 | 162.30 | 172.25 | 711 | 3 |
| 19.031424 | 45.84 | 50.57 | 36.24 | 86.16 | 3517 | 3 |
| 19.096296 | 42.17 | 48.43 | 52.71 | 94.30 | 4009 | 3 |
| 19.166979 | 35.15 | 46.13 | 47.91 | 83.26 | 4094 | 2 |

| | | | | | | |
|-----------|-------|-------|--------|--------|------|----|
| 19.307014 | 27.37 | 36.91 | 51.10 | 75.39 | 4379 | 3 |
| 19.377256 | 24.12 | 34.53 | 54.56 | 74.97 | 4419 | 2 |
| 19.447824 | 22.31 | 38.61 | 54.53 | 75.94 | 4303 | 2 |
| 19.519352 | 25.29 | 43.80 | 51.77 | 79.70 | 4354 | 3 |
| 19.590973 | 21.31 | 45.72 | 50.63 | 80.45 | 4293 | 3 |
| 19.661667 | 18.60 | 45.02 | 44.88 | 75.27 | 4086 | 5 |
| 19.731134 | 19.25 | 35.20 | 45.75 | 70.86 | 4141 | 5 |
| 19.801805 | 23.86 | 34.96 | 46.60 | 70.70 | 4276 | 7 |
| 19.873634 | 29.40 | 39.29 | 64.59 | 92.77 | 4461 | 7 |
| 19.945162 | 36.58 | 48.19 | 54.21 | 95.25 | 4624 | 15 |
| 19.986528 | 43.03 | 38.30 | 55.57 | 95.11 | 962 | 15 |
| 20.023750 | 39.64 | 47.23 | 38.91 | 81.20 | 3395 | 9 |
| 20.086515 | 40.63 | 49.17 | 49.60 | 91.41 | 4010 | 9 |
| 20.227303 | 30.99 | 46.17 | 51.07 | 81.95 | 4229 | 6 |
| 20.297270 | 27.01 | 39.83 | 50.71 | 76.79 | 4384 | 9 |
| 20.367617 | 21.37 | 32.28 | 54.98 | 73.14 | 4429 | 9 |
| 20.438112 | 22.19 | 37.91 | 46.67 | 70.85 | 4326 | 7 |
| 20.509340 | 22.47 | 39.38 | 55.87 | 78.98 | 4326 | 15 |
| 20.581169 | 22.31 | 43.98 | 49.46 | 81.66 | 4324 | 15 |
| 20.652014 | 20.39 | 39.85 | 47.67 | 74.69 | 4116 | 9 |
| 20.721413 | 18.99 | 32.61 | 42.22 | 67.30 | 4113 | 9 |
| 20.792025 | 24.11 | 36.41 | 52.76 | 79.74 | 4276 | 22 |
| 20.868761 | 30.86 | 44.38 | 55.66 | 86.25 | 3810 | 22 |
| 20.935347 | 36.76 | 40.59 | 44.64 | 81.49 | 4614 | 6 |
| 20.985209 | 38.26 | 45.70 | 81.17 | 111.93 | 1794 | 6 |
| 21.019978 | 42.10 | 40.08 | 71.17 | 101.56 | 2603 | 3 |
| 21.076725 | 40.30 | 50.36 | 110.54 | 138.06 | 4024 | 3 |
| 21.147615 | 36.81 | 51.02 | 109.63 | 134.54 | 4066 | 0 |
| 21.217709 | 34.85 | 48.80 | 111.90 | 133.61 | 4210 | 0 |
| 21.357927 | 24.92 | 38.03 | 106.04 | 120.76 | 4428 | 0 |
| 21.428379 | 23.72 | 39.51 | 102.51 | 117.65 | 4364 | 2 |
| 21.580256 | 22.07 | 44.91 | 92.52 | 113.56 | 3358 | 3 |
| 21.642406 | 20.75 | 38.88 | 112.28 | 127.44 | 4149 | 2 |
| 21.711840 | 19.78 | 34.26 | 108.86 | 124.69 | 4064 | 2 |
| 21.782291 | 24.18 | 33.74 | 100.16 | 118.04 | 4261 | 0 |
| 21.853691 | 27.61 | 33.72 | 100.63 | 119.45 | 4376 | 0 |
| 21.925497 | 35.40 | 38.95 | 100.82 | 123.59 | 4608 | 2 |
| 21.981632 | 38.18 | 49.02 | 112.03 | 138.16 | 2629 | 2 |
| 22.017164 | 40.04 | 28.61 | 40.28 | 69.67 | 1777 | 5 |
| 22.137917 | 38.56 | 48.01 | 47.32 | 86.97 | 4048 | 9 |
| 22.208078 | 31.86 | 42.94 | 52.35 | 82.63 | 4194 | 9 |
| 22.278009 | 28.64 | 37.32 | 56.93 | 80.62 | 4345 | 9 |
| 22.348228 | 20.78 | 34.21 | 45.88 | 67.41 | 4412 | 9 |
| 22.418680 | 21.01 | 37.66 | 54.20 | 75.44 | 4387 | 15 |
| 22.489340 | 19.87 | 35.89 | 47.07 | 70.01 | 4254 | 15 |
| 22.561562 | 24.59 | 42.98 | 51.61 | 82.03 | 4358 | 18 |
| 22.632662 | 22.10 | 34.65 | 53.60 | 76.57 | 4180 | 18 |
| 22.702280 | 19.07 | 36.15 | 45.04 | 70.27 | 4020 | 18 |
| 22.772558 | 25.60 | 61.62 | 43.91 | 92.31 | 4246 | 56 |
| 22.843565 | 29.65 | 71.19 | 70.51 | 116.64 | 4300 | 56 |
| 22.915522 | 40.55 | 96.91 | 60.88 | 133.04 | 4541 | 48 |
| 22.975348 | 52.73 | 89.91 | 55.62 | 132.40 | 3124 | 48 |
| 23.012106 | 30.41 | 95.27 | 105.51 | 166.51 | 1313 | 94 |
| 23.056238 | 42.17 | 91.38 | 70.09 | 137.68 | 4186 | 94 |
| 23.128263 | 42.61 | 91.73 | 68.77 | 137.39 | 4022 | 67 |
| 23.198471 | 39.00 | 74.97 | 72.77 | 122.55 | 4175 | 67 |
| 23.268414 | 33.72 | 61.80 | 76.73 | 114.79 | 4326 | 7 |
| 23.338436 | 28.27 | 56.56 | 78.37 | 111.82 | 4393 | 7 |
| 23.408981 | 30.12 | 59.44 | 68.84 | 109.41 | 4397 | 22 |
| 23.560637 | 26.99 | 68.63 | 60.42 | 107.68 | 3381 | 22 |
| 23.622929 | 22.27 | 61.61 | 68.29 | 109.72 | 4203 | 22 |
| 23.692883 | 23.44 | 54.61 | 71.04 | 105.20 | 3916 | 12 |
| 23.734375 | 33.73 | 38.46 | 87.15 | 117.01 | 1003 | 12 |
| 24.005220 | 41.00 | 38.83 | 54.65 | 85.84 | 889 | 6 |
| 24.046204 | 46.07 | 58.30 | 59.81 | 107.31 | 4206 | 6 |
| 24.118553 | 47.27 | 62.41 | 64.63 | 112.81 | 4029 | 6 |
| 24.327593 | 24.25 | 49.47 | 60.34 | 92.11 | 4143 | 27 |
| 24.550764 | 17.60 | 54.48 | 58.86 | 92.63 | 3380 | 9 |
| 24.613253 | 22.17 | 57.06 | 68.36 | 104.54 | 4238 | 9 |
| 24.683346 | 16.51 | 48.22 | 69.94 | 99.22 | 3943 | 9 |
| 24.753147 | 21.59 | 45.47 | 64.62 | 96.02 | 4216 | 9 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 24.824085 | 24.82 | 48.13 | 58.10 | 92.40 | 4282 | 9 |
| 24.895914 | 29.61 | 54.46 | 69.63 | 106.57 | 4522 | 15 |
| 24.966204 | 36.80 | 56.65 | 68.32 | 108.83 | 4419 | 15 |
| 25.000717 | 33.64 | 84.86 | 18.38 | 93.37 | 117 | 7 |
| 25.037489 | 33.04 | 56.09 | 42.11 | 87.77 | 4290 | 7 |
| 25.109873 | 34.05 | 57.03 | 47.89 | 92.42 | 4023 | 7 |
| 25.250174 | 27.68 | 47.15 | 50.45 | 84.75 | 4283 | 7 |
| 25.320023 | 19.51 | 44.34 | 53.67 | 80.86 | 4355 | 7 |
| 25.390614 | 18.49 | 40.35 | 51.25 | 77.06 | 4414 | 5 |
| 25.461250 | 20.41 | 44.39 | 47.14 | 77.81 | 4315 | 5 |
| 25.533068 | 19.52 | 50.38 | 55.66 | 87.01 | 4377 | 4 |
| 25.604490 | 19.50 | 51.39 | 48.96 | 83.83 | 4258 | 4 |
| 25.674965 | 17.03 | 43.89 | 48.19 | 77.54 | 4022 | 5 |
| 25.744469 | 19.15 | 41.30 | 53.84 | 83.31 | 4183 | 5 |
| 25.815243 | 23.71 | 40.38 | 55.08 | 82.45 | 4281 | 9 |
| 25.889399 | 28.44 | 45.92 | 53.13 | 85.56 | 4174 | 6 |
| 25.958633 | 33.50 | 47.58 | 47.09 | 87.06 | 4622 | 6 |
| 25.996529 | 22.82 | 35.21 | 91.90 | 105.70 | 593 | 6 |
| 26.033714 | 37.75 | 52.52 | 42.52 | 87.00 | 3640 | 7 |
| 26.099051 | 35.66 | 52.65 | 42.61 | 86.07 | 4009 | 7 |
| 26.239607 | 28.60 | 48.81 | 53.92 | 86.65 | 4260 | 15 |
| 26.309538 | 20.80 | 39.60 | 49.93 | 74.12 | 4379 | 7 |
| 26.379976 | 20.63 | 38.57 | 51.09 | 75.07 | 4419 | 5 |
| 26.450567 | 19.97 | 36.57 | 51.75 | 73.09 | 4308 | 5 |
| 26.522211 | 19.07 | 45.33 | 60.79 | 86.80 | 4370 | 4 |
| 26.593727 | 20.41 | 44.93 | 45.83 | 75.01 | 4298 | 4 |
| 26.664433 | 16.39 | 41.02 | 54.40 | 78.83 | 4073 | 4 |
| 26.733843 | 18.44 | 35.67 | 49.97 | 76.33 | 4151 | 4 |
| 26.804560 | 23.04 | 38.43 | 46.73 | 75.77 | 4281 | 5 |
| 26.876366 | 25.56 | 45.75 | 53.60 | 87.37 | 4470 | 15 |
| 26.947950 | 35.11 | 53.20 | 49.03 | 93.26 | 4624 | 15 |
| 26.989351 | 44.83 | 40.00 | 70.25 | 108.96 | 968 | 15 |
| 27.026564 | 33.31 | 55.38 | 26.70 | 77.01 | 3385 | 18 |
| 27.089226 | 34.02 | 46.48 | 13.21 | 64.51 | 4003 | 18 |
| 27.160000 | 29.47 | 45.79 | 17.63 | 63.10 | 4082 | 9 |
| 27.230036 | 29.71 | 41.62 | 12.21 | 58.49 | 4239 | 9 |
| 27.299976 | 22.58 | 35.72 | 11.06 | 48.66 | 4377 | 6 |
| 27.370277 | 19.77 | 29.91 | 16.11 | 44.25 | 4423 | 6 |
| 27.440809 | 18.60 | 31.08 | 21.06 | 46.23 | 4332 | 7 |
| 27.512211 | 19.27 | 39.68 | 17.28 | 54.04 | 4342 | 15 |
| 27.583958 | 20.01 | 43.11 | 25.41 | 60.43 | 4322 | 15 |
| 27.654825 | 20.49 | 51.52 | 26.35 | 66.57 | 4114 | 15 |
| 27.724213 | 19.71 | 38.88 | 17.23 | 52.12 | 4115 | 15 |
| 27.794792 | 21.91 | 46.43 | 22.95 | 62.49 | 4274 | 32 |
| 27.866411 | 24.04 | 51.48 | 35.75 | 73.97 | 4458 | 32 |
| 27.938137 | 32.63 | 56.79 | 38.64 | 84.35 | 4611 | 32 |
| 27.985914 | 38.06 | 73.84 | 31.21 | 97.59 | 1560 | 32 |
| 28.021389 | 32.23 | 49.34 | 29.13 | 74.79 | 2892 | 48 |
| 28.080521 | 34.56 | 52.63 | 30.29 | 77.01 | 4019 | 48 |
| 28.151377 | 29.82 | 48.76 | 17.95 | 65.92 | 4072 | 48 |
| 28.221399 | 28.78 | 45.03 | 24.77 | 66.52 | 4217 | 48 |
| 28.291285 | 22.80 | 41.16 | 17.16 | 55.68 | 4355 | 32 |
| 28.361586 | 17.74 | 35.47 | 25.55 | 54.77 | 4430 | 32 |
| 28.432095 | 19.93 | 40.53 | 13.11 | 52.32 | 4353 | 22 |
| 28.502928 | 19.69 | 48.34 | 32.78 | 67.61 | 4255 | 32 |
| 28.575104 | 23.28 | 48.79 | 25.73 | 66.72 | 4330 | 32 |
| 28.646088 | 20.44 | 55.48 | 29.22 | 71.70 | 4143 | 22 |
| 28.715578 | 17.50 | 47.99 | 26.06 | 63.86 | 4074 | 22 |
| 28.785995 | 23.80 | 41.48 | 26.80 | 64.12 | 4269 | 18 |
| 28.857443 | 24.38 | 42.85 | 25.42 | 63.43 | 4408 | 18 |
| 28.929201 | 31.76 | 57.08 | 43.67 | 89.23 | 4622 | 32 |
| 28.983160 | 43.72 | 58.81 | 59.90 | 104.52 | 2331 | 32 |
| 29.018206 | 32.49 | 47.66 | 43.71 | 78.21 | 2077 | 32 |
| 29.070278 | 33.90 | 51.22 | 25.11 | 72.42 | 4103 | 32 |
| 29.141678 | 31.19 | 46.32 | 15.22 | 63.78 | 4052 | 27 |
| 29.211805 | 30.19 | 44.04 | 17.34 | 62.56 | 4200 | 27 |
| 29.281691 | 27.34 | 40.46 | 11.66 | 54.90 | 4353 | 32 |
| 29.351864 | 18.88 | 43.58 | 20.94 | 56.69 | 4421 | 32 |
| 29.422384 | 19.19 | 37.67 | 20.72 | 52.89 | 4383 | 27 |
| 29.493010 | 17.96 | 40.09 | 32.89 | 59.74 | 4243 | 27 |
| 29.565313 | 23.27 | 49.28 | 37.80 | 72.74 | 4350 | 32 |

| | | | | | | |
|-----------|-------|-------|--------|--------|------|----|
| 29.636389 | 19.69 | 51.26 | 27.18 | 67.08 | 4172 | 39 |
| 29.705996 | 17.93 | 56.61 | 39.35 | 79.46 | 4028 | 39 |
| 29.776297 | 24.06 | 51.03 | 28.47 | 72.45 | 4253 | 32 |
| 29.851019 | 18.40 | 39.61 | 21.49 | 56.81 | 3374 | 32 |
| 29.919271 | 31.88 | 47.88 | 25.13 | 70.59 | 4550 | 22 |
| 29.977316 | 36.13 | 51.01 | 30.61 | 78.85 | 2904 | 22 |
| 30.013830 | 39.30 | 50.60 | 47.47 | 88.06 | 1526 | 12 |
| 30.060068 | 34.67 | 51.02 | 42.89 | 84.82 | 4177 | 12 |
| 30.131990 | 34.66 | 48.97 | 50.73 | 87.41 | 4018 | 12 |
| 30.202175 | 30.42 | 48.37 | 53.62 | 85.74 | 4179 | 12 |
| 30.272072 | 26.92 | 41.26 | 53.33 | 78.99 | 4332 | 18 |
| 30.412674 | 19.73 | 36.90 | 53.16 | 75.00 | 4390 | 7 |
| 30.483379 | 21.49 | 43.27 | 47.78 | 76.83 | 4266 | 7 |
| 30.555555 | 24.33 | 51.14 | 53.94 | 88.68 | 4373 | 18 |
| 30.626678 | 22.41 | 47.34 | 49.34 | 83.14 | 4206 | 15 |
| 30.696712 | 16.74 | 40.85 | 57.49 | 83.33 | 3914 | 15 |
| 30.766678 | 20.94 | 46.79 | 49.20 | 83.82 | 4219 | 22 |
| 30.837568 | 24.10 | 49.38 | 54.69 | 89.31 | 4290 | 22 |
| 30.909445 | 34.17 | 48.14 | 51.94 | 90.92 | 4525 | 15 |
| 30.969803 | 39.10 | 50.17 | 51.48 | 93.82 | 3198 | 15 |
| 31.006922 | 31.55 | 34.34 | 70.79 | 93.34 | 1182 | 18 |
| 31.050047 | 36.39 | 55.18 | 100.19 | 132.10 | 4211 | 18 |
| 31.122351 | 37.39 | 52.29 | 108.91 | 136.91 | 4037 | 18 |
| 31.192570 | 31.28 | 51.99 | 109.08 | 131.76 | 4167 | 9 |
| 31.332455 | 21.97 | 43.50 | 111.60 | 128.32 | 4381 | 12 |
| 31.403009 | 23.44 | 46.36 | 107.04 | 125.27 | 4404 | 9 |
| 31.473635 | 21.20 | 44.80 | 100.00 | 118.00 | 4285 | 9 |
| 31.545612 | 24.90 | 44.81 | 100.91 | 123.16 | 4370 | 9 |
| 31.616968 | 23.39 | 47.52 | 107.12 | 130.97 | 4234 | 9 |
| 31.686920 | 17.98 | 39.57 | 116.70 | 133.81 | 3913 | 12 |
| 31.833530 | 28.71 | 41.58 | 94.23 | 117.39 | 3598 | 7 |
| 31.899572 | 31.84 | 43.59 | 101.49 | 125.22 | 4521 | 7 |
| 31.967604 | 38.29 | 43.66 | 105.73 | 131.12 | 4127 | 7 |
| 32.002094 | 45.52 | 41.63 | 14.16 | 64.39 | 353 | 9 |
| 32.040207 | 38.62 | 45.05 | 45.87 | 84.34 | 4264 | 9 |
| 32.112579 | 42.12 | 48.81 | 50.06 | 92.25 | 4022 | 9 |
| 32.182953 | 34.68 | 47.76 | 52.97 | 87.03 | 4136 | 5 |
| 32.252834 | 32.44 | 42.76 | 54.68 | 83.41 | 4288 | 7 |
| 32.322765 | 23.42 | 37.34 | 57.47 | 78.20 | 4357 | 7 |
| 32.393345 | 23.31 | 37.82 | 56.33 | 76.70 | 4411 | 3 |
| 32.463947 | 23.37 | 39.17 | 47.08 | 71.77 | 4312 | 3 |
| 32.535824 | 25.60 | 49.99 | 49.08 | 82.76 | 4375 | 15 |
| 32.607224 | 24.18 | 44.36 | 46.88 | 81.00 | 4254 | 15 |
| 32.754433 | 22.11 | 40.39 | 51.65 | 80.88 | 3376 | 9 |
| 32.818008 | 25.86 | 39.11 | 48.29 | 77.76 | 4279 | 9 |
| 32.889755 | 30.79 | 41.08 | 52.42 | 83.79 | 4500 | 12 |
| 32.961376 | 37.60 | 42.94 | 49.28 | 86.49 | 4606 | 12 |
| 32.997906 | 28.70 | 37.93 | 56.04 | 80.86 | 355 | 12 |
| 33.034733 | 43.27 | 49.67 | 17.18 | 75.41 | 3903 | 9 |
| 33.102825 | 42.80 | 45.56 | 18.28 | 71.76 | 4009 | 9 |
| 33.173428 | 37.57 | 42.81 | 18.06 | 66.49 | 4102 | 5 |
| 33.243263 | 31.94 | 38.58 | 12.68 | 57.68 | 4267 | 5 |
| 33.313217 | 27.79 | 37.79 | 14.74 | 54.83 | 4386 | 3 |
| 33.383671 | 23.24 | 33.33 | 13.72 | 48.19 | 4421 | 6 |
| 33.454224 | 24.47 | 34.24 | 19.05 | 53.04 | 4322 | 6 |
| 33.525970 | 26.64 | 42.21 | 32.63 | 67.45 | 4376 | 12 |
| 33.597443 | 23.08 | 47.35 | 19.22 | 61.60 | 4298 | 12 |
| 33.668079 | 21.98 | 47.88 | 26.35 | 64.73 | 4058 | 18 |
| 33.737568 | 21.92 | 42.32 | 29.37 | 61.62 | 4153 | 18 |
| 33.808250 | 25.90 | 40.83 | 14.36 | 58.58 | 4271 | 7 |
| 33.880024 | 31.20 | 42.76 | 17.51 | 63.12 | 4488 | 7 |
| 33.951595 | 39.11 | 39.94 | 19.25 | 65.67 | 4619 | 7 |
| 33.991528 | 33.49 | 39.43 | 10.94 | 59.68 | 790 | 7 |
| 34.029064 | 40.31 | 46.24 | 41.26 | 83.41 | 3477 | 4 |
| 34.093021 | 43.39 | 50.37 | 45.47 | 89.73 | 4007 | 4 |
| 34.233681 | 33.55 | 45.82 | 55.46 | 86.25 | 4243 | 4 |
| 34.303600 | 27.59 | 40.49 | 51.30 | 77.34 | 4373 | 9 |
| 34.373981 | 23.66 | 38.26 | 49.22 | 72.69 | 4423 | 9 |
| 34.444572 | 24.54 | 38.03 | 53.68 | 76.57 | 4325 | 5 |
| 34.515949 | 26.25 | 41.34 | 42.66 | 72.32 | 4347 | 15 |
| 34.587627 | 26.95 | 50.12 | 55.38 | 89.05 | 4312 | 15 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 34.658447 | 23.11 | 40.03 | 47.85 | 74.84 | 4107 | 12 |
| 34.727905 | 21.24 | 38.69 | 53.26 | 79.54 | 4119 | 12 |
| 34.798485 | 26.71 | 38.93 | 55.19 | 84.23 | 4282 | 12 |
| 34.870140 | 30.17 | 45.26 | 52.85 | 88.82 | 4464 | 12 |
| 34.941296 | 37.86 | 46.14 | 46.81 | 87.06 | 4484 | 22 |
| 34.986889 | 37.24 | 56.28 | 68.28 | 108.97 | 1247 | 22 |
| 35.022442 | 28.74 | 40.11 | 17.13 | 59.16 | 3115 | 7 |
| 35.083275 | 29.89 | 44.86 | 17.70 | 63.22 | 4018 | 7 |
| 35.154133 | 27.57 | 44.33 | 13.39 | 59.47 | 4071 | 5 |
| 35.224098 | 26.13 | 41.26 | 17.44 | 57.50 | 4223 | 5 |
| 35.293968 | 21.51 | 35.47 | 15.37 | 49.92 | 4353 | 7 |
| 35.364258 | 18.97 | 33.47 | 13.74 | 44.74 | 4426 | 7 |
| 35.514469 | 15.48 | 31.92 | 20.67 | 46.32 | 3305 | 4 |
| 35.577847 | 23.05 | 43.20 | 19.44 | 57.33 | 4331 | 4 |
| 35.648750 | 20.58 | 43.70 | 20.19 | 57.32 | 4124 | 4 |
| 35.718220 | 19.99 | 40.66 | 18.07 | 53.52 | 4094 | 4 |
| 35.788750 | 21.88 | 40.52 | 20.66 | 57.17 | 4271 | 3 |
| 35.860268 | 22.76 | 41.21 | 13.15 | 54.48 | 4419 | 3 |
| 35.931919 | 30.33 | 43.31 | 22.96 | 65.10 | 4614 | 7 |
| 35.984200 | 35.86 | 50.28 | 16.65 | 73.61 | 2087 | 7 |
| 36.018970 | 28.01 | 31.88 | 12.93 | 49.45 | 2318 | 4 |
| 36.073242 | 29.60 | 44.29 | 19.96 | 63.58 | 4053 | 4 |
| 36.144398 | 26.73 | 44.93 | 14.64 | 60.06 | 4057 | 2 |
| 36.214493 | 26.40 | 40.78 | 7.38 | 53.84 | 4203 | 2 |
| 36.284374 | 23.12 | 36.83 | 10.16 | 49.52 | 4347 | 2 |
| 36.354515 | 18.34 | 32.18 | 13.03 | 43.43 | 4425 | 2 |
| 36.425102 | 17.45 | 32.49 | 12.28 | 43.38 | 4372 | 4 |
| 36.495789 | 18.59 | 34.24 | 26.10 | 52.78 | 4248 | 4 |
| 36.568138 | 23.70 | 45.06 | 21.36 | 60.11 | 4345 | 4 |
| 36.639118 | 23.22 | 41.86 | 18.85 | 57.91 | 4171 | 15 |
| 36.708706 | 18.97 | 43.25 | 18.22 | 54.94 | 4041 | 15 |
| 36.778992 | 24.11 | 52.19 | 41.45 | 79.81 | 4253 | 32 |
| 36.850243 | 26.80 | 61.87 | 37.41 | 91.97 | 4345 | 32 |
| 36.922050 | 30.80 | 49.83 | 27.56 | 77.34 | 4567 | 32 |
| 36.980278 | 30.23 | 48.32 | 21.68 | 69.25 | 2930 | 32 |
| 37.016701 | 25.08 | 56.84 | 17.03 | 70.50 | 1516 | 39 |
| 37.062904 | 30.03 | 56.15 | 19.17 | 72.80 | 4163 | 39 |
| 37.134758 | 27.28 | 55.48 | 14.50 | 68.68 | 4030 | 48 |
| 37.204861 | 26.50 | 47.54 | 22.56 | 65.52 | 4186 | 48 |
| 37.274769 | 22.39 | 40.19 | 11.67 | 52.80 | 4337 | 22 |
| 37.344837 | 19.01 | 39.54 | 10.28 | 49.22 | 4406 | 22 |
| 37.415405 | 18.10 | 37.67 | 18.15 | 51.28 | 4387 | 32 |
| 37.486088 | 19.02 | 38.44 | 28.12 | 56.92 | 4257 | 32 |
| 37.558300 | 22.76 | 50.21 | 17.78 | 63.25 | 4374 | 27 |
| 37.629444 | 22.63 | 54.74 | 27.48 | 70.72 | 4206 | 18 |
| 37.699306 | 21.77 | 54.88 | 39.17 | 80.87 | 3943 | 18 |
| 37.769260 | 27.26 | 59.16 | 38.95 | 85.46 | 4249 | 39 |
| 37.840324 | 23.43 | 53.11 | 32.25 | 78.69 | 4291 | 39 |
| 37.912140 | 29.66 | 52.81 | 24.65 | 74.73 | 4532 | 48 |
| 37.972443 | 40.08 | 71.19 | 39.31 | 101.40 | 3199 | 48 |
| 38.009315 | 28.51 | 45.99 | 44.88 | 83.07 | 1253 | 56 |
| 38.052814 | 32.02 | 51.62 | 36.60 | 80.57 | 4210 | 56 |
| 38.125034 | 30.34 | 55.82 | 18.92 | 71.00 | 4031 | 22 |
| 38.195267 | 31.03 | 46.90 | 19.37 | 63.66 | 4164 | 22 |
| 38.265148 | 26.76 | 45.13 | 21.65 | 61.52 | 4313 | 22 |
| 38.335163 | 20.41 | 38.20 | 24.70 | 57.77 | 4379 | 22 |
| 38.405704 | 18.02 | 35.61 | 21.68 | 53.12 | 4396 | 27 |
| 38.476376 | 20.12 | 37.17 | 20.38 | 52.45 | 4277 | 27 |
| 38.548405 | 26.08 | 59.37 | 29.62 | 78.64 | 4376 | 39 |
| 38.619675 | 23.32 | 54.05 | 43.77 | 81.84 | 4222 | 39 |
| 38.689663 | 19.73 | 55.57 | 23.55 | 71.61 | 3913 | 27 |
| 38.759594 | 22.79 | 55.51 | 39.33 | 80.68 | 4216 | 27 |
| 38.830532 | 25.25 | 48.26 | 29.90 | 73.90 | 4288 | 27 |
| 38.902290 | 31.65 | 48.48 | 30.59 | 74.50 | 4517 | 27 |
| 38.968449 | 34.20 | 49.29 | 24.73 | 73.25 | 3884 | 27 |
| 39.003483 | 40.27 | 50.38 | 4.92 | 65.96 | 593 | 22 |
| 39.042881 | 36.91 | 49.31 | 33.89 | 78.36 | 4228 | 22 |
| 39.115322 | 37.16 | 48.93 | 14.64 | 68.89 | 4023 | 22 |
| 39.185612 | 32.72 | 46.13 | 12.43 | 63.71 | 4149 | 18 |
| 39.252987 | 28.24 | 40.44 | 11.42 | 55.40 | 3968 | 6 |
| 39.325462 | 23.07 | 36.76 | 18.85 | 52.62 | 4355 | 6 |

| | | | | | | |
|-----------|-------|--------|-------|--------|------|-----|
| 39.396065 | 21.76 | 34.41 | 22.93 | 54.01 | 4405 | 12 |
| 39.466667 | 21.83 | 37.07 | 29.52 | 59.76 | 4300 | 12 |
| 39.538612 | 23.64 | 47.80 | 18.60 | 62.67 | 4385 | 15 |
| 39.609955 | 22.33 | 56.59 | 21.15 | 69.92 | 4250 | 15 |
| 39.680267 | 19.94 | 44.55 | 18.33 | 57.80 | 3990 | 15 |
| 39.749897 | 22.06 | 43.62 | 30.96 | 66.79 | 4199 | 15 |
| 39.820763 | 26.62 | 43.81 | 39.05 | 75.15 | 4282 | 22 |
| 39.892548 | 30.54 | 49.89 | 38.49 | 77.40 | 4510 | 12 |
| 39.964085 | 35.95 | 44.19 | 8.84 | 63.57 | 4609 | 12 |
| 39.999294 | 19.33 | 67.61 | 3.47 | 70.68 | 117 | 12 |
| 40.035393 | 39.52 | 44.81 | 16.31 | 68.47 | 4125 | 6 |
| 40.105534 | 41.71 | 48.97 | 13.12 | 71.51 | 4018 | 6 |
| 40.176125 | 34.84 | 49.37 | 21.47 | 70.71 | 4107 | 15 |
| 40.245983 | 32.11 | 43.90 | 18.82 | 61.80 | 4271 | 15 |
| 40.315811 | 23.31 | 36.53 | 12.69 | 50.40 | 4347 | 12 |
| 40.386425 | 24.01 | 38.96 | 10.83 | 51.86 | 4428 | 5 |
| 40.456921 | 24.49 | 38.60 | 20.48 | 55.64 | 4322 | 5 |
| 40.528706 | 23.22 | 43.08 | 25.98 | 61.39 | 4378 | 15 |
| 40.600197 | 22.62 | 55.99 | 34.56 | 78.18 | 4283 | 15 |
| 40.670776 | 18.40 | 49.75 | 17.51 | 63.75 | 4048 | 22 |
| 40.740265 | 20.33 | 38.36 | 23.28 | 58.24 | 4154 | 22 |
| 40.811020 | 23.77 | 40.99 | 15.93 | 57.45 | 4269 | 7 |
| 40.882801 | 31.25 | 45.67 | 23.53 | 67.66 | 4498 | 6 |
| 40.954365 | 35.68 | 53.83 | 25.80 | 77.84 | 4625 | 6 |
| 40.992939 | 23.63 | 44.94 | 12.14 | 55.90 | 694 | 6 |
| 41.030766 | 41.90 | 44.40 | 15.92 | 69.88 | 3626 | 12 |
| 41.095753 | 39.34 | 47.21 | 16.69 | 70.21 | 4010 | 12 |
| 41.166470 | 35.24 | 46.01 | 22.62 | 69.11 | 4090 | 9 |
| 41.236378 | 31.37 | 46.45 | 16.30 | 64.21 | 4247 | 9 |
| 41.306309 | 24.66 | 37.44 | 17.88 | 53.83 | 4375 | 15 |
| 41.376690 | 23.49 | 38.13 | 13.89 | 51.61 | 4413 | 6 |
| 41.447292 | 22.61 | 38.02 | 17.98 | 52.91 | 4325 | 6 |
| 41.518795 | 22.66 | 44.54 | 23.39 | 62.09 | 4363 | 7 |
| 41.590405 | 22.14 | 48.14 | 14.66 | 60.10 | 4313 | 7 |
| 41.661182 | 19.62 | 41.87 | 20.76 | 57.46 | 4096 | 9 |
| 41.730579 | 19.42 | 39.48 | 22.21 | 55.34 | 4139 | 9 |
| 41.801228 | 24.79 | 39.88 | 20.41 | 58.33 | 4275 | 7 |
| 41.872963 | 30.62 | 45.67 | 23.70 | 66.04 | 4473 | 7 |
| 41.944561 | 36.96 | 55.16 | 25.95 | 78.88 | 4623 | 18 |
| 41.986816 | 43.50 | 45.89 | 16.53 | 71.96 | 1020 | 18 |
| 42.023506 | 36.99 | 42.92 | 15.13 | 65.08 | 3342 | 15 |
| 42.085960 | 38.27 | 48.13 | 12.77 | 68.84 | 4004 | 15 |
| 42.156818 | 32.57 | 53.43 | 16.10 | 70.74 | 4080 | 32 |
| 42.226772 | 30.59 | 43.10 | 10.68 | 58.15 | 4223 | 32 |
| 42.296677 | 26.73 | 39.21 | 18.72 | 56.62 | 4355 | 12 |
| 42.366886 | 22.37 | 38.85 | 14.04 | 51.54 | 4416 | 12 |
| 42.437546 | 23.02 | 41.75 | 19.16 | 56.12 | 4343 | 12 |
| 42.508797 | 20.50 | 44.01 | 22.51 | 59.55 | 4323 | 9 |
| 42.580589 | 19.99 | 48.81 | 20.79 | 61.77 | 4314 | 9 |
| 42.651493 | 18.49 | 53.44 | 31.38 | 72.45 | 4125 | 15 |
| 42.727013 | 23.36 | 53.25 | 31.61 | 74.66 | 3397 | 15 |
| 42.791492 | 26.46 | 43.94 | 15.51 | 61.39 | 4272 | 12 |
| 42.862892 | 30.03 | 49.94 | 25.16 | 70.49 | 4457 | 12 |
| 42.934746 | 37.12 | 56.85 | 19.56 | 77.86 | 4625 | 32 |
| 42.985126 | 43.32 | 51.13 | 14.07 | 75.27 | 1857 | 32 |
| 43.019836 | 37.11 | 74.78 | 80.20 | 130.26 | 2549 | 80 |
| 43.076180 | 34.75 | 71.37 | 61.55 | 112.23 | 4022 | 80 |
| 43.147095 | 32.74 | 68.86 | 44.83 | 99.49 | 4057 | 80 |
| 43.217186 | 31.68 | 52.90 | 45.40 | 85.09 | 4209 | 80 |
| 43.293968 | 28.49 | 55.26 | 49.51 | 86.50 | 3518 | 80 |
| 43.357258 | 21.24 | 69.34 | 70.40 | 112.83 | 4424 | 80 |
| 43.427837 | 22.04 | 110.71 | 93.92 | 163.08 | 4369 | 111 |
| 43.498646 | 26.90 | 119.69 | 69.21 | 159.77 | 4221 | 111 |
| 43.570831 | 26.95 | 95.23 | 49.12 | 126.84 | 4345 | 67 |
| 43.641830 | 25.44 | 84.17 | 60.42 | 122.22 | 4158 | 32 |
| 43.788311 | 37.39 | 83.73 | 51.91 | 122.44 | 3500 | 18 |
| 43.853065 | 35.31 | 75.13 | 47.04 | 111.36 | 4374 | 18 |
| 43.924816 | 42.94 | 72.59 | 63.66 | 121.98 | 4569 | 15 |
| 43.981445 | 44.82 | 72.93 | 54.67 | 116.26 | 2690 | 15 |
| 44.017258 | 40.01 | 56.97 | 54.56 | 98.45 | 1722 | 18 |
| 44.065765 | 40.37 | 68.88 | 52.53 | 105.55 | 4139 | 18 |

| | | | | | | |
|-----------|-------|-------|--------|--------|------|----|
| 44.137478 | 37.96 | 67.15 | 45.04 | 98.03 | 4030 | 7 |
| 44.207581 | 38.12 | 55.01 | 47.45 | 91.22 | 4190 | 7 |
| 44.347580 | 25.21 | 55.43 | 51.75 | 89.64 | 4407 | 12 |
| 44.418125 | 22.62 | 48.61 | 54.99 | 86.46 | 4376 | 22 |
| 44.488796 | 22.14 | 55.82 | 57.84 | 92.55 | 4264 | 22 |
| 44.560993 | 25.00 | 59.43 | 44.80 | 87.64 | 4357 | 18 |
| 44.632175 | 24.05 | 64.23 | 46.69 | 94.85 | 4194 | 18 |
| 44.701805 | 25.38 | 58.66 | 44.98 | 90.03 | 4004 | 18 |
| 44.771980 | 28.69 | 50.99 | 50.44 | 90.24 | 4251 | 9 |
| 44.843056 | 32.09 | 51.22 | 52.62 | 92.92 | 4300 | 9 |
| 44.914860 | 37.33 | 55.33 | 56.18 | 99.50 | 4524 | 12 |
| 44.975243 | 41.32 | 65.17 | 55.46 | 106.67 | 3197 | 12 |
| 45.012074 | 31.38 | 44.41 | 34.43 | 70.21 | 1252 | 22 |
| 45.055626 | 40.67 | 56.32 | 21.56 | 78.24 | 4204 | 22 |
| 45.127754 | 39.35 | 60.00 | 18.66 | 80.44 | 4031 | 32 |
| 45.197964 | 36.26 | 49.36 | 10.08 | 66.70 | 4175 | 32 |
| 45.267872 | 32.82 | 50.27 | 14.34 | 66.64 | 4320 | 27 |
| 45.337906 | 22.85 | 49.00 | 18.78 | 64.35 | 4392 | 27 |
| 45.408463 | 20.70 | 42.39 | 19.94 | 57.54 | 4395 | 32 |
| 45.479118 | 20.18 | 50.01 | 34.58 | 71.71 | 4277 | 32 |
| 45.551159 | 26.81 | 72.35 | 45.94 | 99.60 | 4373 | 56 |
| 45.622433 | 22.56 | 65.24 | 24.10 | 80.25 | 4216 | 56 |
| 45.692371 | 21.95 | 55.75 | 19.52 | 71.79 | 3905 | 39 |
| 45.762337 | 27.60 | 59.36 | 35.23 | 86.49 | 4225 | 27 |
| 45.833252 | 34.39 | 60.90 | 26.77 | 87.36 | 4281 | 27 |
| 45.905094 | 38.81 | 59.06 | 31.17 | 87.99 | 4524 | 27 |
| 45.969131 | 40.83 | 55.45 | 30.96 | 87.56 | 3629 | 27 |
| 46.004848 | 34.98 | 58.28 | 38.27 | 80.77 | 829 | 27 |
| 46.045692 | 38.66 | 59.89 | 29.69 | 82.19 | 4232 | 27 |
| 46.118046 | 40.78 | 58.07 | 18.07 | 79.17 | 4024 | 27 |
| 46.188416 | 35.80 | 51.61 | 21.02 | 70.98 | 4149 | 27 |
| 46.258240 | 33.35 | 48.35 | 9.40 | 63.82 | 4295 | 9 |
| 46.328205 | 25.01 | 41.59 | 16.64 | 57.23 | 4369 | 9 |
| 46.398796 | 26.56 | 43.46 | 18.48 | 60.10 | 4410 | 6 |
| 46.469006 | 19.45 | 46.33 | 17.15 | 56.54 | 4048 | 6 |
| 46.542301 | 23.74 | 50.81 | 17.13 | 63.32 | 3952 | 9 |
| 46.612755 | 23.25 | 50.83 | 14.90 | 63.71 | 4248 | 9 |
| 46.682976 | 19.20 | 46.61 | 14.08 | 56.87 | 3978 | 7 |
| 46.752651 | 23.22 | 47.02 | 16.52 | 61.58 | 4211 | 22 |
| 46.823544 | 28.50 | 44.27 | 95.95 | 121.56 | 4282 | 22 |
| 46.895359 | 25.57 | 47.49 | 107.42 | 132.21 | 4504 | 32 |
| 46.966087 | 29.27 | 55.46 | 140.32 | 170.68 | 4490 | 32 |
| 47.036030 | 26.46 | 52.13 | 151.83 | 174.09 | 4310 | 12 |
| 47.108322 | 37.88 | 51.55 | 168.65 | 190.64 | 4020 | 12 |
| 47.178806 | 45.73 | 54.32 | 182.32 | 206.55 | 4124 | 9 |
| 47.248669 | 45.65 | 55.78 | 174.46 | 198.63 | 4279 | 9 |
| 47.318577 | 35.15 | 56.05 | 184.63 | 205.54 | 4349 | 4 |
| 47.389179 | 31.68 | 51.11 | 191.18 | 209.29 | 4423 | 3 |
| 47.459663 | 31.02 | 47.95 | 204.73 | 220.78 | 4319 | 3 |
| 47.531528 | 33.15 | 47.24 | 230.33 | 246.08 | 4373 | 7 |
| 47.603020 | 35.90 | 52.25 | 253.29 | 270.46 | 4279 | 7 |
| 47.673496 | 20.27 | 61.75 | 204.18 | 221.92 | 4032 | 9 |
| 47.743019 | 24.46 | 45.88 | 71.34 | 96.85 | 4174 | 9 |
| 47.813797 | 26.10 | 53.72 | 45.40 | 82.81 | 4272 | 7 |
| 47.885567 | 27.53 | 50.73 | 36.99 | 76.44 | 4511 | 5 |
| 47.957119 | 30.88 | 50.73 | 38.24 | 77.80 | 4613 | 5 |
| 47.995823 | 26.14 | 46.34 | 48.52 | 77.92 | 710 | 5 |
| 48.033508 | 32.32 | 51.49 | 40.11 | 81.01 | 3599 | 3 |
| 48.098541 | 29.92 | 53.16 | 51.16 | 87.75 | 4012 | 3 |
| 48.169212 | 26.45 | 48.04 | 45.58 | 77.65 | 4098 | 3 |
| 48.239098 | 23.56 | 43.10 | 51.55 | 77.22 | 4263 | 3 |
| 48.309074 | 19.39 | 39.41 | 52.54 | 74.98 | 4374 | 4 |
| 48.379501 | 17.81 | 40.14 | 57.77 | 78.63 | 4434 | 12 |
| 48.450047 | 17.44 | 39.60 | 62.91 | 82.74 | 4315 | 12 |
| 48.521572 | 21.64 | 45.25 | 46.10 | 76.38 | 4357 | 9 |
| 48.593193 | 25.34 | 56.54 | 51.63 | 89.31 | 4302 | 9 |
| 48.663898 | 21.57 | 52.07 | 49.01 | 84.37 | 4079 | 6 |
| 48.733356 | 23.98 | 50.29 | 57.24 | 90.37 | 4148 | 6 |
| 48.881042 | 25.85 | 50.06 | 55.41 | 89.57 | 3842 | 3 |
| 48.947350 | 31.43 | 52.19 | 47.12 | 86.37 | 4615 | 3 |
| 48.988483 | 43.65 | 52.39 | 58.25 | 103.31 | 935 | 3 |

| | | | | | | |
|-----------|-------|-------|-------|-------|------|----|
| 49.025707 | 27.41 | 48.00 | 13.74 | 62.88 | 3433 | 0 |
| 49.088760 | 28.87 | 51.60 | 14.54 | 67.83 | 4010 | 0 |
| 49.159550 | 25.43 | 50.01 | 16.79 | 65.38 | 4075 | 2 |
| 49.229538 | 23.60 | 42.12 | 10.69 | 53.40 | 4232 | 2 |
| 49.299435 | 20.25 | 40.34 | 10.11 | 50.75 | 4368 | 2 |
| 49.369698 | 18.01 | 36.24 | 14.34 | 47.51 | 4424 | 2 |
| 49.440357 | 18.45 | 38.49 | 16.75 | 50.86 | 4346 | 2 |
| 49.511597 | 20.72 | 43.65 | 16.41 | 55.70 | 4325 | 2 |
| 49.583412 | 24.06 | 52.03 | 17.25 | 65.23 | 4322 | 2 |
| 49.654305 | 21.21 | 49.70 | 12.63 | 59.63 | 4125 | 0 |
| 49.723694 | 23.80 | 45.33 | 10.96 | 57.36 | 4118 | 0 |
| 49.794247 | 26.05 | 43.56 | 18.09 | 59.91 | 4271 | 2 |
| 49.865742 | 25.80 | 47.79 | 18.81 | 63.12 | 4467 | 2 |
| 49.937523 | 30.69 | 49.41 | 14.25 | 66.06 | 4624 | 0 |
| 49.985985 | 37.28 | 54.10 | 17.14 | 77.22 | 1613 | 0 |
| 50.020832 | 26.18 | 39.81 | 15.56 | 54.92 | 2778 | 0 |
| 50.078995 | 28.34 | 48.32 | 14.20 | 63.60 | 4018 | 0 |
| 50.149872 | 25.87 | 49.32 | 15.50 | 64.16 | 4067 | 0 |
| 50.219906 | 23.38 | 43.27 | 13.88 | 55.35 | 4211 | 0 |
| 50.289791 | 19.84 | 40.98 | 12.54 | 51.37 | 4337 | 5 |
| 50.360035 | 17.84 | 34.79 | 14.04 | 46.45 | 4425 | 5 |
| 50.430603 | 18.85 | 34.51 | 17.12 | 49.18 | 4357 | 7 |
| 50.501389 | 21.10 | 38.42 | 17.23 | 52.03 | 4247 | 3 |
| 50.573647 | 24.14 | 46.76 | 27.79 | 68.14 | 4337 | 3 |
| 50.644608 | 22.17 | 46.19 | 19.37 | 60.77 | 4149 | 3 |
| 50.714119 | 23.24 | 43.44 | 12.93 | 55.63 | 4065 | 3 |
| 50.784527 | 25.31 | 43.30 | 12.37 | 56.19 | 4267 | 3 |
| 50.855904 | 24.37 | 44.92 | 18.16 | 60.68 | 4388 | 3 |
| 50.927593 | 29.77 | 48.24 | 15.44 | 66.88 | 4566 | 3 |
| 50.982571 | 30.23 | 52.27 | 12.56 | 68.29 | 2454 | 3 |
| 51.017845 | 30.28 | 37.57 | 17.18 | 55.74 | 1953 | 2 |
| 51.068691 | 29.07 | 49.75 | 14.71 | 65.11 | 4113 | 2 |
| 51.140278 | 27.14 | 47.92 | 21.06 | 65.43 | 4043 | 3 |
| 51.210335 | 24.58 | 45.32 | 17.19 | 59.31 | 4193 | 3 |
| 51.280209 | 22.33 | 42.10 | 11.27 | 53.26 | 4337 | 6 |
| 51.350346 | 17.62 | 34.36 | 19.26 | 48.37 | 4412 | 6 |
| 51.420914 | 19.36 | 35.94 | 17.96 | 49.72 | 4375 | 4 |
| 51.491619 | 20.53 | 36.58 | 12.53 | 48.14 | 4262 | 4 |
| 51.563797 | 24.26 | 48.34 | 15.94 | 61.46 | 4354 | 2 |
| 51.634930 | 23.17 | 48.69 | 13.12 | 60.56 | 4173 | 0 |
| 51.704548 | 20.62 | 46.39 | 15.27 | 57.80 | 4019 | 0 |
| 51.774757 | 24.14 | 43.37 | 17.22 | 58.63 | 4241 | 4 |
| 51.845856 | 22.97 | 46.20 | 14.58 | 59.41 | 4303 | 4 |
| 51.917641 | 30.82 | 53.40 | 19.54 | 71.75 | 4520 | 22 |
| 51.975971 | 28.32 | 58.77 | 12.13 | 72.13 | 2925 | 22 |
| 52.012730 | 36.51 | 41.45 | 29.26 | 72.67 | 1490 | 22 |
| 52.058449 | 28.29 | 51.54 | 15.02 | 67.33 | 4185 | 22 |
| 52.130531 | 25.41 | 54.29 | 19.34 | 69.84 | 4036 | 39 |
| 52.200684 | 21.26 | 50.24 | 20.48 | 64.42 | 4171 | 39 |
| 52.270626 | 19.85 | 46.61 | 16.35 | 58.21 | 4328 | 15 |
| 52.340683 | 17.00 | 40.60 | 17.33 | 51.33 | 4397 | 15 |
| 52.411240 | 18.89 | 36.63 | 22.31 | 54.45 | 4392 | 12 |
| 52.481899 | 19.61 | 36.93 | 14.71 | 49.86 | 4271 | 12 |
| 52.554028 | 24.02 | 51.32 | 19.31 | 65.09 | 4378 | 22 |
| 52.625198 | 24.55 | 56.94 | 25.28 | 71.92 | 4209 | 39 |
| 52.695198 | 19.26 | 43.96 | 20.08 | 59.31 | 3909 | 39 |
| 52.765102 | 25.49 | 42.20 | 23.86 | 62.86 | 4232 | 12 |
| 52.836063 | 25.21 | 44.25 | 10.21 | 58.36 | 4288 | 12 |
| 52.907917 | 29.92 | 48.22 | 19.04 | 68.54 | 4525 | 7 |
| 52.969860 | 30.85 | 59.99 | 21.55 | 79.21 | 3383 | 7 |
| 53.006248 | 34.18 | 27.46 | 11.00 | 47.85 | 1069 | 7 |
| 53.048519 | 31.54 | 47.75 | 19.81 | 66.78 | 4208 | 7 |
| 53.120800 | 30.99 | 48.59 | 16.75 | 66.90 | 4021 | 7 |
| 53.191158 | 28.60 | 45.09 | 15.49 | 61.16 | 4146 | 9 |
| 53.258728 | 23.04 | 43.35 | 17.75 | 57.85 | 4025 | 3 |
| 53.331005 | 19.23 | 38.34 | 18.95 | 51.73 | 4370 | 3 |
| 53.401562 | 19.72 | 37.29 | 15.96 | 49.43 | 4404 | 3 |
| 53.472187 | 20.04 | 37.22 | 18.37 | 52.43 | 4288 | 3 |
| 53.544155 | 23.72 | 44.55 | 20.59 | 60.15 | 4375 | 7 |
| 53.615475 | 23.76 | 44.44 | 20.78 | 59.57 | 4231 | 7 |
| 53.685520 | 19.33 | 47.52 | 16.36 | 58.13 | 3933 | 6 |

| | | | | | | |
|-----------|-------|-------|-------|-------|------|----|
| 53.755417 | 28.55 | 44.72 | 20.25 | 62.81 | 4211 | 4 |
| 53.826298 | 24.42 | 42.84 | 20.01 | 59.94 | 4276 | 4 |
| 53.898113 | 25.92 | 42.72 | 25.31 | 62.37 | 4517 | 6 |
| 53.967049 | 27.06 | 45.57 | 22.85 | 63.73 | 4248 | 6 |
| 54.001400 | 24.17 | 38.02 | 10.86 | 46.86 | 235 | 7 |
| 54.038715 | 23.98 | 44.98 | 23.53 | 62.61 | 4265 | 7 |
| 54.111111 | 25.30 | 43.58 | 22.76 | 62.08 | 4021 | 7 |
| 54.181576 | 22.39 | 43.37 | 22.10 | 59.95 | 4124 | 3 |
| 54.251423 | 20.91 | 42.09 | 12.02 | 52.77 | 4287 | 6 |
| 54.321320 | 17.08 | 42.44 | 17.86 | 53.25 | 4351 | 6 |
| 54.391945 | 15.90 | 39.26 | 18.12 | 50.77 | 4417 | 15 |
| 54.462418 | 17.72 | 43.09 | 20.91 | 56.26 | 4317 | 15 |
| 54.534363 | 20.43 | 51.98 | 42.77 | 80.22 | 4382 | 27 |
| 54.605728 | 25.53 | 48.25 | 28.98 | 68.67 | 4261 | 27 |
| 54.676193 | 22.51 | 49.57 | 18.35 | 62.64 | 4013 | 18 |
| 54.745716 | 27.59 | 44.32 | 21.00 | 62.88 | 4178 | 18 |
| 54.816551 | 26.52 | 44.16 | 23.52 | 63.22 | 4278 | 4 |
| 54.888287 | 26.28 | 48.02 | 29.39 | 68.96 | 4495 | 6 |
| 54.959873 | 25.71 | 45.57 | 25.95 | 65.51 | 4613 | 6 |
| 54.997211 | 40.84 | 36.22 | 15.80 | 63.70 | 473 | 6 |
| 55.034271 | 21.68 | 48.67 | 27.79 | 66.35 | 3802 | 15 |
| 55.101295 | 22.21 | 43.24 | 25.01 | 61.74 | 4010 | 15 |
| 55.171898 | 21.41 | 47.65 | 23.37 | 63.55 | 4103 | 39 |
| 55.241829 | 18.56 | 45.10 | 13.93 | 56.65 | 4268 | 39 |
| 55.311760 | 16.63 | 37.39 | 14.82 | 48.26 | 4370 | 22 |
| 55.382271 | 17.74 | 41.09 | 17.82 | 53.91 | 4430 | 39 |
| 55.452766 | 18.63 | 38.34 | 13.69 | 50.21 | 4328 | 39 |
| 55.524467 | 21.32 | 42.68 | 26.16 | 62.01 | 4373 | 27 |
| 55.595963 | 29.78 | 54.93 | 26.93 | 76.55 | 4289 | 27 |
| 55.666668 | 24.89 | 53.59 | 23.87 | 70.95 | 4073 | 27 |
| 55.736111 | 29.80 | 58.27 | 25.21 | 77.93 | 4148 | 27 |
| 55.806839 | 24.21 | 48.95 | 20.08 | 63.88 | 4274 | 32 |
| 55.878624 | 26.55 | 51.18 | 36.01 | 75.39 | 4481 | 39 |
| 55.950161 | 31.85 | 44.92 | 28.72 | 70.96 | 4627 | 39 |
| 55.991215 | 42.30 | 51.95 | 26.29 | 80.17 | 929 | 39 |
| 56.028461 | 30.93 | 47.26 | 35.01 | 74.49 | 3418 | 22 |
| 56.091576 | 31.86 | 44.91 | 30.69 | 70.76 | 4019 | 22 |
| 56.162270 | 27.99 | 49.67 | 32.89 | 73.18 | 4090 | 32 |
| 56.232246 | 26.72 | 41.74 | 24.11 | 60.87 | 4247 | 32 |
| 56.302162 | 22.13 | 46.70 | 19.28 | 60.73 | 4366 | 27 |
| 56.372440 | 18.24 | 33.84 | 21.54 | 48.78 | 4428 | 27 |
| 56.443111 | 17.45 | 35.78 | 19.33 | 51.08 | 4338 | 18 |
| 56.514469 | 19.63 | 45.75 | 31.95 | 66.00 | 4350 | 22 |
| 56.586205 | 21.53 | 46.22 | 20.32 | 60.77 | 4321 | 22 |
| 56.657013 | 18.06 | 45.31 | 19.06 | 57.74 | 4118 | 18 |
| 56.726425 | 20.02 | 43.76 | 25.13 | 59.61 | 4117 | 18 |
| 56.797050 | 22.25 | 40.87 | 21.48 | 58.77 | 4277 | 9 |
| 56.868530 | 23.54 | 40.80 | 29.79 | 63.28 | 4480 | 9 |
| 56.940346 | 30.62 | 46.01 | 29.27 | 69.62 | 4617 | 15 |
| 56.986572 | 32.68 | 50.53 | 31.13 | 74.91 | 1380 | 15 |
| 57.021889 | 30.81 | 41.88 | 40.81 | 74.19 | 3002 | 15 |
| 57.081760 | 32.41 | 47.78 | 40.82 | 80.04 | 4016 | 15 |
| 57.152546 | 28.15 | 48.79 | 42.46 | 77.71 | 4062 | 12 |
| 57.362778 | 18.81 | 36.15 | 50.54 | 71.09 | 4422 | 15 |
| 57.433369 | 17.23 | 36.94 | 49.17 | 70.79 | 4354 | 18 |
| 57.512280 | 18.13 | 37.66 | 44.87 | 67.65 | 3335 | 7 |
| 57.576378 | 22.17 | 45.22 | 47.73 | 77.97 | 4327 | 7 |
| 57.647339 | 18.83 | 42.87 | 47.97 | 73.95 | 4141 | 15 |
| 57.716827 | 18.94 | 41.03 | 51.73 | 78.45 | 4084 | 15 |
| 57.787327 | 24.04 | 44.14 | 47.70 | 80.09 | 4268 | 27 |
| 57.858784 | 24.10 | 52.90 | 50.09 | 86.76 | 4404 | 27 |
| 57.930557 | 29.15 | 46.59 | 41.81 | 79.06 | 4621 | 18 |
| 57.983646 | 28.61 | 58.80 | 43.69 | 89.25 | 2212 | 18 |
| 58.018505 | 35.92 | 43.68 | 27.37 | 70.88 | 2200 | 22 |
| 58.071598 | 30.55 | 47.32 | 27.07 | 69.09 | 4098 | 22 |
| 58.142963 | 27.65 | 47.19 | 26.06 | 66.72 | 4019 | 7 |
| 58.213196 | 26.10 | 43.41 | 20.80 | 59.98 | 4184 | 7 |
| 58.282963 | 24.03 | 42.80 | 15.22 | 56.43 | 4334 | 9 |
| 58.353138 | 18.83 | 36.23 | 16.20 | 48.55 | 4425 | 9 |
| 58.423634 | 17.42 | 36.02 | 15.72 | 47.60 | 4366 | 15 |
| 58.494362 | 18.30 | 34.02 | 21.46 | 50.37 | 4257 | 15 |

| | | | | | | |
|-----------|-------|-------|-------|-------|------|----|
| 58.566608 | 24.30 | 44.81 | 26.82 | 64.18 | 4346 | 18 |
| 58.637684 | 20.46 | 47.42 | 23.85 | 62.15 | 4171 | 15 |
| 58.707233 | 19.52 | 43.69 | 24.74 | 58.97 | 4034 | 15 |
| 58.777557 | 20.84 | 43.93 | 23.79 | 59.19 | 4257 | 9 |
| 58.848682 | 20.28 | 44.46 | 22.05 | 59.56 | 4324 | 9 |
| 58.920635 | 30.00 | 47.24 | 26.60 | 68.13 | 4573 | 9 |
| 58.978737 | 25.75 | 48.84 | 32.70 | 71.14 | 2917 | 9 |
| 59.015301 | 35.87 | 31.36 | 10.05 | 54.49 | 1513 | 15 |
| 59.061295 | 30.61 | 44.53 | 24.99 | 65.91 | 4184 | 15 |
| 59.133308 | 28.96 | 51.75 | 35.83 | 75.83 | 4037 | 27 |
| 59.203506 | 27.09 | 42.78 | 28.76 | 64.70 | 4165 | 27 |
| 59.273357 | 22.67 | 37.08 | 18.29 | 53.03 | 4326 | 15 |
| 59.343449 | 17.88 | 39.93 | 18.87 | 54.07 | 4397 | 15 |
| 59.413971 | 18.48 | 38.62 | 23.55 | 53.98 | 4390 | 15 |
| 59.484642 | 20.29 | 42.46 | 30.20 | 62.86 | 4260 | 15 |
| 59.556850 | 26.32 | 52.99 | 34.38 | 78.18 | 4379 | 27 |
| 59.628021 | 27.36 | 47.54 | 20.62 | 64.57 | 4210 | 12 |
| 59.697987 | 27.02 | 49.41 | 19.80 | 65.24 | 3930 | 12 |
| 59.767838 | 27.79 | 47.95 | 23.61 | 66.69 | 4247 | 7 |
| 59.838856 | 24.32 | 45.23 | 24.77 | 64.29 | 4297 | 7 |
| 59.910706 | 29.25 | 47.76 | 30.73 | 71.36 | 4533 | 9 |
| 59.971237 | 30.07 | 47.63 | 31.67 | 73.30 | 3223 | 9 |
| 60.008091 | 27.37 | 32.17 | 38.03 | 64.01 | 1233 | 3 |
| 60.051388 | 25.80 | 50.12 | 39.32 | 76.31 | 4218 | 3 |
| 60.123600 | 23.76 | 48.51 | 41.76 | 75.43 | 4025 | 3 |
| 60.193935 | 25.23 | 41.90 | 41.23 | 70.88 | 4149 | 5 |
| 60.254364 | 22.50 | 40.61 | 42.87 | 69.35 | 3222 | 9 |
| 60.333763 | 17.99 | 36.64 | 44.06 | 67.06 | 4381 | 9 |
| 60.404316 | 14.98 | 33.90 | 50.05 | 68.25 | 4399 | 15 |
| 60.474964 | 17.82 | 37.68 | 48.10 | 69.87 | 4287 | 15 |
| 60.546955 | 21.97 | 44.99 | 49.21 | 77.32 | 4367 | 9 |
| 60.618275 | 24.02 | 46.69 | 47.48 | 78.20 | 4233 | 9 |
| 60.688229 | 20.12 | 45.82 | 49.02 | 78.33 | 3911 | 5 |
| 60.835068 | 22.91 | 42.42 | 40.33 | 70.69 | 3584 | 4 |
| 60.900913 | 26.46 | 41.62 | 48.15 | 77.96 | 4524 | 5 |
| 60.967953 | 28.36 | 40.82 | 46.75 | 77.20 | 3993 | 5 |
| 61.002789 | 39.12 | 44.51 | 12.67 | 62.24 | 473 | 9 |
| 61.041424 | 27.16 | 46.43 | 27.62 | 67.94 | 4241 | 9 |
| 61.113888 | 26.62 | 43.68 | 24.25 | 63.86 | 4010 | 9 |
| 61.184307 | 23.98 | 46.32 | 27.21 | 65.06 | 4122 | 22 |
| 61.254177 | 22.29 | 49.39 | 32.33 | 71.52 | 4287 | 32 |
| 61.324097 | 17.96 | 43.95 | 24.63 | 61.18 | 4356 | 32 |
| 61.394688 | 15.01 | 38.31 | 24.00 | 53.40 | 4414 | 22 |
| 61.465206 | 17.28 | 41.36 | 27.95 | 60.31 | 4311 | 22 |
| 61.537128 | 20.34 | 47.79 | 29.41 | 67.86 | 4374 | 18 |
| 61.608528 | 24.79 | 49.31 | 39.75 | 79.19 | 4257 | 18 |
| 61.678867 | 21.86 | 54.01 | 33.70 | 78.29 | 3993 | 18 |
| 61.748493 | 25.79 | 49.76 | 22.76 | 67.89 | 4198 | 18 |
| 61.819363 | 24.32 | 51.51 | 24.14 | 68.42 | 4275 | 15 |
| 61.891125 | 26.18 | 47.37 | 28.63 | 69.47 | 4501 | 32 |
| 61.962742 | 29.88 | 59.27 | 25.75 | 77.65 | 4596 | 32 |
| 61.998611 | 22.51 | 87.02 | 9.24 | 92.09 | 237 | 32 |
| 62.034966 | 28.70 | 55.83 | 42.64 | 85.54 | 4010 | 39 |
| 62.104095 | 28.13 | 53.98 | 35.36 | 77.91 | 4003 | 39 |
| 62.174675 | 24.07 | 46.75 | 27.42 | 65.67 | 4112 | 18 |
| 62.244572 | 22.07 | 41.01 | 16.51 | 54.45 | 4268 | 18 |
| 62.314537 | 18.50 | 39.39 | 14.87 | 51.57 | 4369 | 6 |
| 62.385036 | 17.66 | 34.83 | 20.31 | 49.75 | 4424 | 4 |
| 62.455521 | 17.32 | 34.73 | 18.54 | 48.17 | 4329 | 4 |
| 62.527313 | 20.73 | 41.03 | 22.11 | 57.72 | 4370 | 7 |
| 62.598785 | 21.58 | 46.64 | 19.62 | 61.54 | 4292 | 7 |
| 62.669411 | 18.18 | 45.45 | 18.91 | 58.07 | 4057 | 4 |
| 62.738876 | 23.18 | 45.02 | 23.64 | 61.47 | 4144 | 4 |
| 62.809643 | 24.58 | 42.16 | 25.32 | 61.43 | 4273 | 3 |
| 62.881401 | 24.77 | 45.68 | 30.74 | 66.39 | 4486 | 7 |
| 62.952976 | 28.76 | 46.66 | 23.22 | 65.65 | 4620 | 7 |
| 62.991550 | 23.93 | 46.76 | 23.11 | 65.11 | 694 | 7 |
| 63.029339 | 29.81 | 42.74 | 25.08 | 65.33 | 3624 | 4 |
| 63.094376 | 28.07 | 44.24 | 25.10 | 64.99 | 4020 | 4 |
| 63.165058 | 24.74 | 47.58 | 22.53 | 64.04 | 4097 | 2 |
| 63.234802 | 24.53 | 40.91 | 14.61 | 54.78 | 4231 | 2 |

| | | | | | | |
|-----------|-------|-------|-------|-------|------|----|
| 63.303715 | 19.43 | 40.86 | 13.80 | 51.53 | 4208 | 2 |
| 63.375267 | 18.15 | 35.12 | 16.75 | 47.50 | 4425 | 4 |
| 63.445904 | 16.86 | 33.04 | 19.18 | 46.75 | 4328 | 4 |
| 63.517281 | 19.74 | 38.76 | 23.13 | 55.51 | 4346 | 7 |
| 63.589016 | 21.97 | 45.42 | 23.25 | 61.53 | 4319 | 7 |
| 63.659733 | 19.21 | 45.21 | 20.47 | 58.56 | 4096 | 5 |
| 63.729225 | 22.88 | 44.36 | 25.30 | 61.01 | 4131 | 5 |
| 63.799782 | 24.20 | 43.55 | 22.87 | 60.29 | 4265 | 9 |
| 63.871563 | 23.41 | 45.34 | 29.92 | 65.60 | 4459 | 9 |
| 63.943138 | 27.97 | 44.46 | 24.60 | 65.06 | 4611 | 6 |
| 63.986874 | 38.43 | 55.37 | 31.55 | 81.26 | 1137 | 6 |
| 64.022949 | 24.88 | 38.92 | 19.52 | 57.66 | 3238 | 0 |
| 64.084557 | 27.72 | 45.63 | 26.99 | 67.23 | 4004 | 0 |
| 64.155418 | 25.28 | 45.89 | 24.95 | 64.66 | 4078 | 0 |
| 64.225380 | 24.37 | 40.67 | 14.33 | 54.01 | 4223 | 0 |
| 64.295303 | 20.59 | 40.73 | 13.87 | 51.73 | 4353 | 2 |
| 64.366249 | 18.10 | 35.61 | 14.69 | 46.62 | 4333 | 2 |
| 64.436195 | 16.62 | 34.88 | 15.11 | 45.71 | 4354 | 3 |
| 64.507271 | 19.14 | 37.33 | 19.75 | 52.29 | 4303 | 6 |
| 64.579216 | 23.06 | 47.62 | 20.52 | 62.46 | 4329 | 6 |
| 64.650124 | 20.12 | 47.12 | 24.83 | 62.57 | 4127 | 7 |
| 64.719574 | 23.13 | 42.94 | 20.80 | 58.14 | 4097 | 7 |
| 64.790108 | 24.86 | 43.16 | 23.33 | 60.49 | 4269 | 3 |
| 64.861618 | 24.10 | 42.34 | 24.15 | 61.36 | 4415 | 3 |
| 64.933334 | 27.84 | 43.86 | 25.32 | 64.65 | 4622 | 3 |
| 64.984711 | 30.35 | 44.91 | 30.27 | 69.05 | 1978 | 3 |
| 65.019432 | 27.18 | 37.66 | 21.53 | 59.58 | 2420 | 2 |
| 65.074539 | 26.53 | 43.81 | 24.49 | 63.90 | 4059 | 2 |
| 65.145744 | 23.68 | 45.96 | 24.69 | 63.38 | 4062 | 7 |
| 65.215904 | 23.49 | 42.15 | 16.16 | 55.74 | 4190 | 7 |
| 65.285706 | 20.71 | 37.98 | 10.74 | 48.78 | 4344 | 3 |
| 65.355888 | 16.82 | 34.99 | 16.16 | 46.45 | 4425 | 3 |
| 65.426491 | 16.01 | 35.23 | 16.64 | 46.28 | 4369 | 4 |
| 65.497154 | 18.96 | 35.95 | 19.26 | 51.07 | 4240 | 4 |
| 65.569435 | 23.61 | 46.97 | 19.23 | 61.72 | 4348 | 5 |
| 65.640450 | 21.35 | 47.61 | 22.87 | 62.27 | 4162 | 6 |
| 65.710014 | 22.29 | 45.54 | 22.08 | 60.50 | 4055 | 6 |
| 65.780373 | 23.35 | 43.34 | 23.52 | 59.91 | 4258 | 7 |
| 65.851677 | 21.08 | 48.14 | 20.97 | 62.65 | 4349 | 7 |
| 65.923370 | 26.34 | 49.02 | 25.96 | 69.46 | 4563 | 15 |
| 65.980843 | 24.83 | 49.15 | 32.08 | 69.65 | 2822 | 15 |
| 66.017036 | 35.05 | 35.15 | 7.17 | 54.75 | 1613 | 6 |
| 66.064224 | 26.57 | 46.43 | 23.77 | 65.13 | 4155 | 6 |
| 66.136055 | 24.24 | 48.51 | 23.95 | 65.44 | 4051 | 9 |
| 66.206306 | 23.91 | 44.97 | 14.74 | 58.18 | 4174 | 9 |
| 66.276123 | 23.11 | 41.94 | 13.40 | 54.85 | 4325 | 15 |
| 66.346214 | 16.28 | 44.06 | 28.77 | 61.86 | 4406 | 15 |
| 66.416779 | 13.84 | 34.68 | 20.65 | 47.14 | 4382 | 15 |
| 66.487480 | 16.66 | 39.52 | 25.98 | 55.60 | 4259 | 15 |
| 66.559631 | 21.95 | 44.81 | 20.02 | 59.41 | 4368 | 12 |
| 66.630753 | 22.05 | 48.19 | 22.39 | 62.65 | 4204 | 15 |
| 66.700615 | 19.12 | 47.99 | 24.25 | 62.08 | 3969 | 15 |
| 66.770622 | 24.14 | 48.03 | 33.45 | 69.96 | 4251 | 9 |
| 66.841667 | 22.19 | 43.59 | 30.65 | 65.61 | 4291 | 9 |
| 66.913475 | 26.88 | 43.06 | 26.75 | 65.20 | 4536 | 15 |
| 66.973946 | 29.45 | 49.06 | 31.29 | 72.79 | 3206 | 15 |
| 67.010727 | 34.99 | 35.23 | 11.14 | 55.29 | 1249 | 15 |
| 67.054176 | 30.00 | 50.59 | 34.12 | 74.89 | 4214 | 15 |
| 67.126320 | 27.32 | 54.04 | 39.20 | 78.48 | 4039 | 22 |
| 67.196693 | 26.77 | 47.87 | 29.91 | 68.37 | 4157 | 22 |
| 67.266502 | 26.78 | 45.83 | 23.14 | 63.89 | 4316 | 18 |
| 67.336540 | 17.71 | 44.24 | 23.42 | 58.68 | 4387 | 18 |
| 67.407120 | 15.09 | 43.00 | 25.69 | 57.66 | 4394 | 15 |
| 67.477768 | 15.96 | 36.80 | 20.09 | 50.43 | 4277 | 15 |
| 67.549805 | 21.43 | 49.19 | 26.85 | 65.73 | 4371 | 15 |
| 67.621078 | 24.24 | 52.57 | 39.90 | 78.07 | 4223 | 15 |
| 67.691063 | 16.87 | 46.38 | 20.43 | 58.68 | 3922 | 15 |
| 67.760986 | 22.96 | 43.37 | 21.96 | 60.67 | 4218 | 12 |
| 67.831947 | 22.51 | 48.85 | 30.69 | 68.45 | 4281 | 12 |
| 67.903740 | 27.10 | 50.07 | 41.47 | 78.75 | 4524 | 18 |
| 67.968811 | 28.89 | 49.77 | 30.07 | 71.42 | 3758 | 18 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 68.004181 | 43.01 | 45.00 | 7.99 | 65.40 | 711 | 9 |
| 68.044296 | 29.68 | 54.33 | 26.07 | 74.02 | 4233 | 9 |
| 68.116631 | 31.10 | 50.54 | 25.98 | 70.87 | 4024 | 9 |
| 68.187073 | 28.03 | 47.42 | 28.90 | 68.29 | 4134 | 12 |
| 68.256958 | 27.08 | 41.92 | 13.11 | 56.03 | 4295 | 6 |
| 68.326851 | 20.98 | 40.64 | 19.76 | 55.35 | 4368 | 6 |
| 68.397453 | 17.64 | 39.89 | 24.93 | 54.66 | 4412 | 15 |
| 68.468033 | 16.98 | 39.28 | 24.65 | 55.31 | 4308 | 15 |
| 68.539963 | 20.44 | 49.83 | 30.65 | 67.72 | 4385 | 15 |
| 68.611351 | 22.50 | 51.04 | 27.16 | 67.71 | 4253 | 15 |
| 68.681633 | 20.16 | 50.17 | 24.58 | 67.06 | 3987 | 27 |
| 68.751282 | 21.42 | 48.89 | 42.53 | 80.00 | 4199 | 22 |
| 68.822166 | 23.47 | 56.11 | 39.49 | 82.17 | 4283 | 22 |
| 68.893944 | 29.24 | 51.91 | 31.84 | 76.65 | 4509 | 7 |
| 68.965546 | 34.27 | 46.90 | 23.62 | 70.40 | 4605 | 7 |
| 69.035645 | 38.07 | 51.47 | 26.78 | 76.88 | 4202 | 9 |
| 69.106873 | 38.25 | 48.68 | 29.39 | 75.54 | 4021 | 9 |
| 69.177475 | 32.63 | 46.23 | 25.78 | 67.92 | 4118 | 3 |
| 69.247330 | 33.09 | 43.42 | 14.42 | 60.53 | 4276 | 3 |
| 69.317223 | 24.74 | 41.50 | 17.87 | 56.76 | 4352 | 2 |
| 69.387779 | 23.20 | 36.29 | 18.27 | 53.12 | 4422 | 3 |
| 69.458313 | 20.44 | 35.93 | 18.16 | 52.36 | 4320 | 3 |
| 69.530136 | 23.83 | 45.99 | 19.21 | 62.08 | 4376 | 6 |
| 69.601608 | 23.56 | 48.52 | 21.02 | 64.32 | 4291 | 6 |
| 69.672142 | 20.64 | 45.44 | 15.69 | 57.31 | 4042 | 3 |
| 69.741623 | 20.15 | 42.08 | 19.89 | 56.23 | 4163 | 3 |
| 69.812431 | 22.89 | 42.45 | 23.87 | 60.21 | 4285 | 4 |
| 69.884239 | 27.16 | 41.78 | 30.03 | 64.41 | 4489 | 4 |
| 69.955704 | 33.39 | 42.83 | 28.73 | 67.47 | 4615 | 4 |
| 69.994270 | 22.20 | 42.64 | 22.55 | 57.23 | 684 | 4 |
| 70.032074 | 38.10 | 41.77 | 28.96 | 70.74 | 3619 | 4 |
| 70.097137 | 36.84 | 46.59 | 39.93 | 81.17 | 4021 | 4 |
| 70.167809 | 31.08 | 45.87 | 39.29 | 75.39 | 4098 | 3 |
| 70.237717 | 29.87 | 42.12 | 42.55 | 72.96 | 4254 | 3 |
| 70.307709 | 21.94 | 39.35 | 39.85 | 66.49 | 4381 | 5 |
| 70.378113 | 20.68 | 38.18 | 46.50 | 68.95 | 4432 | 7 |
| 70.448692 | 21.06 | 39.33 | 50.79 | 74.49 | 4322 | 7 |
| 70.520195 | 22.48 | 48.90 | 48.59 | 80.88 | 4356 | 9 |
| 70.591827 | 23.64 | 51.84 | 48.69 | 83.61 | 4306 | 9 |
| 70.662560 | 19.81 | 48.02 | 44.77 | 78.96 | 4086 | 9 |
| 70.808876 | 26.07 | 49.14 | 38.46 | 78.04 | 3532 | 7 |
| 70.874329 | 26.42 | 52.19 | 50.50 | 89.46 | 4473 | 7 |
| 70.945969 | 36.92 | 50.79 | 56.92 | 99.23 | 4619 | 27 |
| 70.987038 | 41.80 | 71.81 | 86.84 | 135.74 | 925 | 27 |
| 71.024200 | 35.55 | 53.85 | 45.18 | 87.99 | 3434 | 22 |
| 71.089363 | 39.12 | 53.27 | 38.64 | 85.12 | 3788 | 22 |
| 71.158226 | 32.94 | 50.29 | 30.36 | 73.75 | 4090 | 18 |
| 71.228218 | 32.50 | 43.98 | 18.87 | 62.74 | 4228 | 18 |
| 71.298065 | 28.39 | 49.03 | 25.76 | 68.60 | 4354 | 12 |
| 71.368347 | 23.08 | 37.37 | 24.95 | 55.68 | 4422 | 12 |
| 71.439003 | 19.65 | 40.69 | 20.26 | 55.11 | 4348 | 6 |
| 71.510246 | 20.62 | 47.44 | 26.70 | 64.52 | 4334 | 22 |
| 71.582047 | 22.10 | 51.81 | 33.17 | 73.53 | 4325 | 22 |
| 71.652916 | 20.32 | 51.21 | 24.34 | 67.55 | 4124 | 7 |
| 71.722359 | 20.37 | 50.86 | 27.63 | 69.54 | 4104 | 7 |
| 71.792908 | 25.72 | 48.21 | 28.45 | 69.75 | 4275 | 5 |
| 71.864395 | 24.18 | 51.91 | 27.46 | 70.16 | 4450 | 5 |
| 71.936180 | 30.98 | 48.34 | 28.06 | 71.82 | 4620 | 9 |
| 71.985603 | 33.33 | 53.23 | 28.27 | 75.88 | 1742 | 9 |
| 72.020348 | 32.03 | 54.39 | 33.71 | 78.86 | 2658 | 12 |
| 72.077583 | 33.85 | 53.44 | 34.07 | 79.06 | 4021 | 12 |
| 72.148544 | 29.34 | 44.98 | 25.34 | 64.62 | 4062 | 22 |
| 72.218712 | 30.78 | 47.63 | 27.69 | 69.05 | 4199 | 22 |
| 72.288475 | 26.49 | 42.11 | 12.71 | 56.80 | 4342 | 27 |
| 72.368057 | 15.39 | 34.12 | 17.08 | 46.61 | 3204 | 27 |
| 72.429268 | 16.42 | 37.97 | 15.02 | 48.60 | 4366 | 32 |
| 72.499954 | 18.43 | 37.65 | 33.19 | 61.03 | 4240 | 32 |
| 72.572281 | 21.46 | 48.17 | 19.78 | 61.42 | 4346 | 27 |
| 72.643295 | 20.79 | 51.37 | 20.02 | 63.85 | 4153 | 15 |
| 72.712791 | 20.36 | 44.93 | 26.85 | 62.91 | 4069 | 15 |
| 72.783180 | 23.25 | 43.19 | 19.85 | 59.16 | 4256 | 7 |

| | | | | | | |
|-----------|-------|-------|-------|-------|------|----|
| 72.854477 | 22.81 | 41.75 | 19.74 | 57.95 | 4356 | 7 |
| 72.926178 | 28.68 | 45.18 | 31.67 | 69.61 | 4575 | 9 |
| 72.982040 | 28.92 | 54.03 | 36.53 | 79.07 | 2580 | 9 |
| 73.017502 | 38.26 | 46.94 | 33.77 | 75.46 | 1841 | 12 |
| 73.067108 | 32.70 | 50.53 | 28.58 | 73.13 | 4149 | 12 |
| 73.138817 | 28.33 | 47.80 | 28.61 | 69.66 | 4041 | 5 |
| 73.209099 | 27.83 | 42.41 | 17.99 | 59.45 | 4181 | 5 |
| 73.278900 | 26.86 | 40.03 | 11.81 | 54.83 | 4337 | 2 |
| 73.349014 | 21.02 | 35.78 | 15.72 | 49.59 | 4412 | 2 |
| 73.419563 | 17.74 | 37.14 | 18.26 | 49.61 | 4371 | 0 |
| 73.490280 | 19.22 | 38.42 | 22.36 | 55.03 | 4266 | 0 |
| 73.562477 | 22.10 | 44.25 | 22.16 | 60.31 | 4363 | 0 |
| 73.633591 | 22.04 | 46.77 | 20.41 | 60.61 | 4194 | 0 |
| 73.703239 | 18.74 | 46.08 | 19.68 | 57.98 | 4016 | 0 |
| 73.773483 | 21.75 | 43.19 | 20.77 | 59.11 | 4248 | 6 |
| 73.844551 | 22.95 | 41.41 | 25.49 | 60.20 | 4287 | 6 |
| 73.916283 | 28.70 | 41.11 | 30.51 | 66.41 | 4546 | 6 |
| 73.975800 | 31.52 | 46.64 | 38.84 | 76.04 | 3078 | 6 |
| 74.012428 | 37.93 | 32.75 | 19.15 | 57.56 | 1365 | 7 |
| 74.057053 | 33.94 | 46.52 | 26.11 | 69.95 | 4206 | 7 |
| 74.129166 | 33.61 | 45.81 | 26.75 | 69.82 | 4037 | 6 |
| 74.199493 | 31.36 | 43.40 | 20.99 | 63.49 | 4159 | 6 |
| 74.269318 | 32.11 | 40.83 | 13.98 | 58.48 | 4316 | 4 |
| 74.339355 | 22.12 | 40.66 | 19.93 | 55.22 | 4394 | 4 |
| 74.409897 | 19.06 | 36.82 | 18.22 | 49.66 | 4393 | 6 |
| 74.480576 | 19.62 | 36.12 | 19.57 | 51.76 | 4272 | 6 |
| 74.552673 | 23.30 | 45.19 | 22.82 | 61.87 | 4367 | 4 |
| 74.621178 | 20.56 | 49.76 | 23.32 | 63.86 | 3685 | 4 |
| 74.694756 | 19.11 | 45.64 | 18.94 | 58.25 | 3281 | 5 |
| 74.763885 | 27.99 | 46.66 | 20.50 | 63.67 | 3817 | 6 |
| 74.835281 | 24.92 | 45.28 | 23.65 | 64.11 | 3640 | 6 |
| 74.906738 | 27.85 | 45.62 | 34.41 | 71.68 | 4482 | 6 |
| 74.969604 | 28.23 | 46.49 | 29.02 | 70.14 | 3511 | 6 |
| 75.005577 | 32.84 | 33.11 | 12.49 | 51.71 | 950 | 3 |
| 75.047150 | 25.08 | 47.12 | 27.96 | 67.57 | 4235 | 3 |
| 75.119476 | 25.69 | 43.65 | 28.79 | 66.12 | 4031 | 3 |
| 75.189896 | 26.42 | 43.11 | 25.81 | 63.75 | 4137 | 0 |
| 75.259758 | 24.06 | 40.56 | 16.16 | 55.34 | 4303 | 2 |
| 75.329697 | 19.39 | 38.60 | 18.49 | 52.13 | 4374 | 2 |
| 75.479271 | 14.29 | 31.16 | 14.84 | 42.03 | 3335 | 2 |
| 75.542908 | 22.53 | 41.80 | 18.21 | 56.19 | 4374 | 2 |
| 75.614204 | 25.40 | 47.35 | 18.45 | 62.56 | 4239 | 2 |
| 75.684341 | 20.49 | 45.71 | 16.71 | 57.51 | 3955 | 3 |
| 75.754120 | 26.36 | 41.87 | 23.32 | 60.86 | 4204 | 2 |
| 75.825035 | 24.99 | 42.69 | 22.74 | 61.86 | 4290 | 2 |
| 75.896736 | 27.74 | 42.76 | 28.21 | 65.60 | 4511 | 0 |
| 75.966629 | 29.18 | 41.31 | 23.68 | 63.33 | 4366 | 0 |
| 76.000717 | 25.31 | 50.10 | 18.95 | 59.46 | 117 | 0 |
| 76.037376 | 25.17 | 43.24 | 26.10 | 64.55 | 4270 | 0 |
| 76.109772 | 26.63 | 42.56 | 29.11 | 66.36 | 4025 | 0 |
| 76.180275 | 25.74 | 42.57 | 29.77 | 65.33 | 4126 | 0 |
| 76.250160 | 22.51 | 40.22 | 16.83 | 54.41 | 4285 | 0 |
| 76.320038 | 18.58 | 40.23 | 20.95 | 52.94 | 4349 | 0 |
| 76.390648 | 17.13 | 36.33 | 15.54 | 47.36 | 4419 | 2 |
| 76.461090 | 19.08 | 37.52 | 16.39 | 49.72 | 4304 | 2 |
| 76.533134 | 19.08 | 32.24 | 19.35 | 47.06 | 3423 | 2 |
| 76.613052 | 18.93 | 37.65 | 18.56 | 50.92 | 3340 | 2 |
| 76.674988 | 22.38 | 45.65 | 16.29 | 59.19 | 4027 | 3 |
| 76.744431 | 27.66 | 44.68 | 21.47 | 63.37 | 4173 | 3 |
| 76.815247 | 26.72 | 44.26 | 22.83 | 63.39 | 4289 | 3 |
| 76.887001 | 27.74 | 45.07 | 26.65 | 65.52 | 4495 | 4 |
| 76.958603 | 28.35 | 41.81 | 23.48 | 62.74 | 4615 | 4 |
| 76.996529 | 40.74 | 45.67 | 18.16 | 72.49 | 592 | 4 |
| 77.033653 | 25.29 | 42.95 | 25.22 | 63.78 | 3624 | 7 |
| 77.098915 | 26.32 | 43.51 | 29.12 | 66.79 | 4020 | 7 |
| 77.169708 | 25.19 | 43.86 | 29.07 | 65.82 | 4104 | 5 |
| 77.239632 | 22.08 | 41.13 | 17.23 | 55.77 | 4255 | 5 |
| 77.309570 | 18.12 | 42.66 | 20.15 | 54.78 | 4384 | 6 |
| 77.380020 | 16.83 | 37.09 | 17.73 | 48.99 | 4434 | 6 |
| 77.450577 | 19.38 | 34.60 | 15.05 | 46.86 | 4319 | 6 |
| 77.522118 | 19.93 | 39.64 | 15.32 | 51.45 | 4362 | 6 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 77.593727 | 26.82 | 45.89 | 17.64 | 62.09 | 4297 | 6 |
| 77.664375 | 22.66 | 45.79 | 16.05 | 58.77 | 4084 | 2 |
| 77.733856 | 27.00 | 47.66 | 25.80 | 66.67 | 4145 | 2 |
| 77.804535 | 28.38 | 45.63 | 26.33 | 67.03 | 4280 | 2 |
| 77.876411 | 27.15 | 44.96 | 30.59 | 67.95 | 4472 | 0 |
| 77.947960 | 29.19 | 45.55 | 26.34 | 67.56 | 4626 | 0 |
| 77.989326 | 46.69 | 51.58 | 30.71 | 86.04 | 960 | 0 |
| 78.026520 | 23.25 | 39.47 | 26.91 | 60.89 | 3392 | 0 |
| 78.089226 | 25.72 | 41.28 | 28.97 | 65.34 | 4019 | 0 |
| 78.160049 | 25.71 | 45.43 | 28.83 | 67.10 | 4094 | 2 |
| 78.230080 | 22.73 | 41.63 | 15.26 | 55.10 | 4232 | 2 |
| 78.299934 | 19.10 | 41.36 | 19.81 | 54.66 | 4358 | 2 |
| 78.370209 | 17.40 | 39.33 | 19.78 | 52.82 | 4417 | 2 |
| 78.440865 | 19.34 | 38.34 | 16.83 | 50.73 | 4339 | 6 |
| 78.512222 | 21.60 | 38.77 | 17.74 | 53.77 | 4345 | 6 |
| 78.583939 | 27.19 | 48.47 | 19.34 | 65.02 | 4322 | 6 |
| 78.654793 | 24.24 | 48.66 | 20.35 | 64.11 | 4117 | 7 |
| 78.724167 | 29.80 | 49.67 | 20.95 | 68.21 | 4108 | 7 |
| 78.794769 | 29.43 | 44.40 | 25.69 | 67.34 | 4279 | 15 |
| 78.866409 | 25.90 | 44.80 | 28.43 | 65.87 | 4462 | 15 |
| 78.938087 | 28.75 | 44.87 | 23.91 | 66.31 | 4611 | 6 |
| 78.985985 | 34.61 | 50.71 | 42.18 | 84.48 | 1559 | 6 |
| 79.020958 | 25.44 | 46.40 | 18.41 | 62.68 | 2831 | 7 |
| 79.079422 | 26.11 | 43.71 | 27.37 | 65.74 | 4020 | 7 |
| 79.150345 | 23.53 | 43.42 | 23.57 | 61.93 | 4069 | 15 |
| 79.220490 | 23.27 | 41.69 | 21.56 | 59.86 | 4210 | 15 |
| 79.290314 | 19.86 | 39.91 | 17.29 | 54.93 | 4345 | 7 |
| 79.360565 | 17.86 | 34.95 | 22.14 | 52.03 | 4427 | 7 |
| 79.431160 | 17.89 | 36.49 | 17.26 | 49.72 | 4351 | 6 |
| 79.501945 | 20.75 | 38.06 | 17.60 | 53.31 | 4254 | 7 |
| 79.574226 | 26.72 | 46.53 | 16.88 | 63.27 | 4346 | 7 |
| 79.645149 | 24.46 | 47.78 | 14.34 | 60.40 | 4143 | 6 |
| 79.714561 | 29.78 | 46.06 | 18.93 | 64.43 | 4088 | 6 |
| 79.785057 | 27.44 | 47.24 | 25.30 | 65.63 | 4260 | 6 |
| 79.856514 | 26.33 | 45.06 | 25.59 | 65.95 | 4389 | 6 |
| 79.928329 | 30.64 | 46.00 | 30.29 | 71.47 | 4613 | 4 |
| 79.982742 | 35.88 | 46.15 | 41.61 | 82.08 | 2400 | 4 |
| 80.017815 | 26.15 | 44.71 | 26.59 | 65.84 | 2024 | 4 |
| 80.068970 | 26.59 | 43.97 | 48.74 | 82.56 | 4149 | 4 |
| 80.140694 | 29.52 | 48.53 | 72.03 | 109.09 | 4030 | 2 |
| 80.210892 | 31.46 | 51.34 | 68.75 | 107.99 | 4190 | 2 |
| 80.280731 | 27.37 | 46.42 | 61.33 | 93.44 | 4333 | 5 |
| 80.350906 | 23.21 | 45.32 | 67.84 | 94.31 | 4417 | 5 |
| 80.421432 | 27.91 | 42.76 | 71.99 | 97.39 | 4372 | 15 |
| 80.492172 | 23.46 | 39.37 | 35.37 | 67.61 | 4260 | 15 |
| 80.564384 | 30.38 | 43.16 | 29.71 | 68.58 | 4359 | 12 |
| 80.635437 | 29.73 | 52.19 | 30.26 | 76.42 | 4183 | 3 |
| 80.705070 | 26.65 | 53.59 | 21.89 | 70.63 | 4025 | 3 |
| 80.775291 | 30.19 | 48.88 | 25.70 | 70.08 | 4245 | 2 |
| 80.846474 | 27.64 | 47.08 | 15.39 | 63.21 | 4305 | 2 |
| 80.918274 | 31.85 | 46.97 | 21.27 | 68.35 | 4561 | 3 |
| 80.956490 | 45.41 | 35.63 | 10.58 | 65.97 | 513 | 3 |
| 81.059723 | 31.18 | 47.78 | 17.35 | 67.12 | 4111 | 2 |
| 81.130974 | 27.27 | 45.99 | 18.79 | 64.45 | 4037 | 2 |
| 81.201271 | 25.55 | 45.69 | 15.11 | 61.17 | 4172 | 2 |
| 81.266899 | 24.01 | 47.11 | 15.77 | 61.03 | 3806 | 5 |
| 81.341484 | 21.22 | 45.03 | 14.83 | 56.90 | 4359 | 5 |
| 81.411781 | 23.86 | 39.91 | 22.73 | 55.90 | 4395 | 3 |
| 81.482452 | 26.24 | 39.71 | 18.37 | 56.94 | 4270 | 3 |
| 81.554619 | 30.34 | 48.20 | 22.01 | 68.18 | 4371 | 6 |
| 81.625778 | 30.28 | 52.10 | 17.34 | 69.72 | 4213 | 6 |
| 81.695717 | 24.53 | 53.26 | 13.49 | 65.74 | 3915 | 6 |
| 81.765640 | 27.59 | 49.74 | 24.97 | 68.26 | 4234 | 5 |
| 81.836655 | 26.70 | 47.21 | 13.83 | 62.58 | 4282 | 5 |
| 81.908417 | 30.79 | 50.40 | 20.89 | 69.07 | 4529 | 0 |
| 81.970024 | 33.63 | 57.96 | 19.44 | 77.40 | 3339 | 0 |
| 82.006607 | 31.60 | 26.48 | 13.50 | 46.29 | 1129 | 6 |
| 82.049004 | 31.09 | 47.66 | 18.47 | 67.21 | 4224 | 6 |
| 82.121307 | 27.22 | 46.48 | 19.48 | 64.90 | 4041 | 6 |
| 82.191711 | 26.40 | 45.95 | 24.82 | 66.40 | 4157 | 9 |
| 82.261559 | 23.19 | 47.19 | 24.50 | 64.96 | 4308 | 12 |

| | | | | | | |
|-----------|-------|-------|-------|-------|------|----|
| 82.331573 | 20.35 | 45.92 | 21.28 | 60.89 | 4379 | 12 |
| 82.402061 | 22.65 | 43.70 | 19.05 | 57.91 | 4395 | 7 |
| 82.472755 | 26.48 | 48.83 | 26.43 | 67.75 | 4290 | 7 |
| 82.544708 | 29.11 | 47.03 | 31.20 | 70.70 | 4371 | 15 |
| 82.616074 | 31.75 | 56.14 | 20.54 | 75.58 | 4231 | 15 |
| 82.686157 | 24.21 | 52.63 | 25.24 | 68.66 | 3947 | 18 |
| 82.755981 | 23.81 | 53.82 | 28.36 | 71.56 | 4212 | 18 |
| 82.826942 | 23.61 | 50.72 | 22.32 | 66.15 | 4283 | 18 |
| 82.898659 | 29.20 | 45.74 | 22.72 | 68.32 | 4511 | 12 |
| 82.967110 | 29.77 | 51.41 | 28.84 | 74.24 | 4165 | 12 |
| 83.001747 | 34.86 | 56.87 | 29.68 | 73.62 | 295 | 15 |
| 83.039177 | 28.22 | 46.53 | 16.09 | 63.74 | 4251 | 15 |
| 83.111588 | 26.33 | 44.34 | 24.64 | 63.89 | 4033 | 15 |
| 83.182144 | 25.96 | 44.69 | 23.85 | 64.45 | 4128 | 18 |
| 83.252014 | 22.20 | 45.15 | 15.67 | 58.75 | 4284 | 12 |
| 83.321922 | 20.13 | 43.73 | 19.49 | 58.54 | 4358 | 12 |
| 83.392487 | 21.97 | 42.55 | 20.18 | 59.30 | 4419 | 15 |
| 83.463013 | 25.23 | 40.45 | 18.25 | 56.07 | 4321 | 15 |
| 83.534943 | 29.02 | 48.93 | 27.73 | 69.27 | 4380 | 22 |
| 83.606293 | 29.35 | 53.58 | 23.81 | 73.53 | 4267 | 22 |
| 83.676796 | 23.92 | 52.39 | 24.01 | 68.54 | 4035 | 18 |
| 83.717476 | 31.55 | 68.39 | 21.99 | 85.00 | 960 | 18 |
| 84.276932 | 22.42 | 29.42 | 52.96 | 64.62 | 26 | 5 |
| 84.312294 | 21.50 | 49.82 | 25.29 | 66.49 | 4346 | 5 |
| 84.382858 | 21.46 | 40.39 | 15.74 | 53.40 | 4431 | 15 |
| 84.453400 | 23.01 | 40.96 | 10.27 | 52.19 | 4312 | 15 |
| 84.525070 | 29.24 | 50.67 | 32.12 | 73.65 | 4374 | 22 |
| 84.596565 | 29.72 | 55.46 | 26.16 | 75.75 | 4292 | 22 |
| 84.667213 | 23.83 | 52.59 | 19.17 | 66.07 | 4085 | 18 |
| 84.736679 | 25.73 | 53.65 | 22.49 | 68.97 | 4155 | 18 |
| 84.807381 | 28.43 | 52.36 | 17.16 | 69.16 | 4284 | 5 |
| 84.879250 | 26.33 | 53.13 | 31.75 | 73.51 | 4480 | 6 |
| 84.950768 | 31.48 | 49.19 | 27.58 | 73.30 | 4619 | 6 |
| 84.991226 | 38.89 | 59.78 | 14.62 | 81.34 | 866 | 6 |
| 85.028603 | 27.71 | 44.45 | 28.06 | 68.17 | 3470 | 7 |
| 85.092072 | 28.79 | 45.75 | 27.58 | 68.69 | 4015 | 7 |
| 85.232925 | 24.73 | 45.62 | 15.61 | 61.39 | 4232 | 9 |
| 85.302780 | 22.67 | 44.89 | 15.93 | 58.93 | 4372 | 9 |
| 85.373093 | 21.52 | 41.61 | 17.07 | 55.31 | 4425 | 9 |
| 85.443718 | 22.55 | 41.07 | 21.12 | 56.92 | 4331 | 6 |
| 85.515091 | 25.76 | 42.32 | 24.26 | 60.61 | 4350 | 5 |
| 85.586815 | 30.04 | 53.53 | 12.26 | 67.61 | 4313 | 5 |
| 85.657623 | 24.28 | 55.90 | 17.22 | 68.21 | 4118 | 15 |
| 85.726990 | 28.68 | 54.12 | 25.13 | 72.68 | 4143 | 15 |
| 85.797661 | 26.68 | 54.69 | 18.78 | 68.15 | 4273 | 12 |
| 85.869202 | 26.27 | 50.65 | 23.17 | 68.49 | 4481 | 12 |
| 85.941010 | 30.65 | 44.26 | 22.42 | 67.53 | 4619 | 2 |
| 85.986595 | 41.69 | 45.61 | 21.03 | 76.15 | 1317 | 2 |
| 86.022072 | 25.19 | 44.41 | 21.37 | 61.97 | 3070 | 2 |
| 86.082329 | 30.59 | 43.75 | 30.62 | 70.09 | 4026 | 2 |
| 86.153244 | 28.41 | 47.48 | 24.13 | 67.95 | 4074 | 0 |
| 86.223320 | 25.62 | 45.29 | 18.33 | 61.84 | 4216 | 0 |
| 86.293159 | 23.61 | 46.17 | 19.30 | 62.53 | 4346 | 3 |
| 86.363426 | 22.32 | 41.21 | 17.51 | 55.64 | 4422 | 3 |
| 86.433990 | 23.46 | 42.34 | 15.46 | 55.55 | 4350 | 3 |
| 86.504883 | 26.72 | 42.08 | 19.30 | 59.66 | 4272 | 3 |
| 86.577057 | 28.44 | 51.09 | 19.54 | 66.89 | 4342 | 3 |
| 86.647995 | 26.27 | 54.64 | 14.86 | 67.92 | 4144 | 6 |
| 86.717422 | 26.77 | 52.93 | 24.29 | 69.57 | 4090 | 6 |
| 86.787941 | 27.75 | 48.77 | 26.75 | 69.47 | 4261 | 5 |
| 86.859467 | 26.14 | 51.22 | 22.22 | 66.81 | 4439 | 5 |
| 86.932106 | 30.64 | 50.53 | 32.30 | 76.21 | 4449 | 5 |
| 86.983856 | 32.49 | 43.88 | 15.46 | 64.37 | 2156 | 5 |
| 87.018623 | 29.44 | 49.02 | 26.48 | 71.74 | 2247 | 4 |
| 87.071922 | 31.32 | 44.96 | 21.23 | 66.75 | 4137 | 4 |
| 87.143555 | 28.32 | 49.37 | 21.27 | 69.18 | 4057 | 5 |
| 87.213730 | 27.30 | 45.20 | 28.74 | 68.96 | 4196 | 5 |
| 87.283531 | 25.11 | 47.75 | 29.64 | 70.06 | 4330 | 4 |
| 87.353714 | 21.89 | 41.37 | 14.62 | 54.87 | 4416 | 4 |
| 87.424248 | 24.21 | 43.59 | 17.10 | 58.29 | 4370 | 3 |
| 87.494987 | 27.32 | 41.53 | 25.00 | 61.92 | 4253 | 3 |

| | | | | | | |
|-----------|-------|-------|-------|-------|------|----|
| 87.567268 | 28.99 | 50.45 | 18.25 | 66.06 | 4355 | 5 |
| 87.638245 | 24.47 | 48.24 | 19.37 | 63.42 | 4169 | 3 |
| 87.707893 | 19.56 | 44.88 | 25.61 | 61.01 | 4037 | 3 |
| 87.778221 | 20.38 | 45.88 | 24.26 | 60.46 | 4254 | 3 |
| 87.849503 | 22.26 | 43.26 | 22.48 | 59.52 | 4342 | 3 |
| 87.921112 | 27.70 | 45.58 | 29.39 | 68.46 | 4536 | 4 |
| 87.959053 | 29.26 | 31.97 | 16.81 | 53.77 | 475 | 4 |
| 88.062370 | 29.63 | 44.15 | 32.10 | 69.97 | 4134 | 6 |
| 88.133881 | 28.99 | 44.84 | 30.17 | 70.12 | 4031 | 6 |
| 88.204117 | 27.82 | 43.81 | 28.62 | 67.52 | 4183 | 6 |
| 88.274002 | 24.73 | 38.40 | 21.31 | 57.97 | 4332 | 5 |
| 88.344070 | 18.95 | 36.47 | 20.53 | 51.38 | 4404 | 5 |
| 88.414619 | 17.26 | 34.22 | 19.92 | 48.07 | 4392 | 5 |
| 88.485489 | 19.70 | 35.32 | 24.73 | 54.71 | 4188 | 5 |
| 88.557526 | 23.66 | 44.05 | 21.30 | 60.89 | 4372 | 3 |
| 88.628647 | 23.54 | 45.79 | 21.54 | 61.55 | 4214 | 3 |
| 88.698563 | 17.50 | 43.64 | 20.92 | 55.39 | 3943 | 3 |
| 88.768486 | 20.95 | 41.91 | 26.17 | 59.85 | 4235 | 2 |
| 88.839561 | 21.41 | 44.78 | 28.40 | 63.49 | 4294 | 2 |
| 88.911293 | 27.21 | 44.71 | 31.16 | 68.38 | 4534 | 0 |
| 88.971977 | 28.52 | 49.38 | 36.56 | 76.98 | 3242 | 0 |
| 89.008781 | 36.88 | 29.49 | 12.96 | 52.01 | 1230 | 2 |
| 89.051918 | 30.26 | 42.09 | 33.61 | 70.77 | 4231 | 2 |
| 89.124176 | 30.91 | 44.45 | 30.99 | 71.31 | 4032 | 2 |
| 89.194557 | 29.00 | 41.79 | 23.78 | 63.64 | 4166 | 2 |
| 89.264420 | 26.98 | 39.26 | 20.69 | 58.85 | 4315 | 3 |
| 89.334412 | 21.47 | 38.28 | 22.13 | 55.07 | 4374 | 3 |
| 89.404991 | 23.31 | 36.14 | 18.03 | 52.22 | 4403 | 4 |
| 89.475616 | 20.05 | 35.27 | 23.04 | 53.25 | 4287 | 4 |
| 89.547653 | 23.81 | 40.29 | 24.46 | 59.55 | 4378 | 4 |
| 89.618973 | 23.21 | 44.57 | 21.41 | 60.72 | 4242 | 4 |
| 89.688934 | 17.70 | 43.97 | 19.29 | 54.90 | 3920 | 4 |
| 89.758804 | 18.56 | 47.88 | 33.81 | 68.23 | 4226 | 27 |
| 89.829803 | 19.24 | 50.36 | 32.06 | 70.35 | 4285 | 27 |
| 89.901505 | 25.93 | 46.89 | 37.45 | 76.09 | 4523 | 32 |
| 89.968063 | 30.95 | 52.23 | 42.22 | 85.01 | 3945 | 32 |
| 90.003136 | 47.72 | 43.08 | 12.68 | 68.28 | 534 | 15 |
| 90.042038 | 29.81 | 46.24 | 27.75 | 70.29 | 4248 | 15 |
| 90.114479 | 30.66 | 45.51 | 28.76 | 70.16 | 4035 | 15 |
| 90.184975 | 27.84 | 44.05 | 26.23 | 66.41 | 4136 | 9 |
| 90.254875 | 28.64 | 39.30 | 18.78 | 57.53 | 4286 | 7 |
| 90.324738 | 21.79 | 38.13 | 21.16 | 55.04 | 4350 | 7 |
| 90.395332 | 20.26 | 34.94 | 19.90 | 49.68 | 4414 | 4 |
| 90.465904 | 21.21 | 32.99 | 24.70 | 53.18 | 4306 | 4 |
| 90.537857 | 23.89 | 40.75 | 25.97 | 61.28 | 4375 | 9 |
| 90.609177 | 25.74 | 45.09 | 27.18 | 64.54 | 4251 | 9 |
| 90.679626 | 19.80 | 44.63 | 22.18 | 57.71 | 4011 | 9 |
| 90.749199 | 18.56 | 46.05 | 27.64 | 61.99 | 4189 | 9 |
| 90.820045 | 22.25 | 50.53 | 33.33 | 74.87 | 4279 | 32 |
| 90.891762 | 25.67 | 48.95 | 35.90 | 75.69 | 4505 | 15 |
| 90.963402 | 34.70 | 43.81 | 24.45 | 67.36 | 4607 | 15 |
| 90.998947 | 23.33 | 66.38 | 14.16 | 72.33 | 175 | 15 |
| 91.034950 | 45.25 | 44.57 | 29.92 | 78.78 | 4031 | 18 |
| 91.104759 | 34.77 | 47.95 | 39.56 | 79.53 | 4016 | 18 |
| 91.175385 | 30.70 | 47.00 | 30.06 | 71.92 | 4120 | 39 |
| 91.245346 | 33.11 | 47.56 | 30.41 | 71.16 | 4250 | 39 |
| 91.315186 | 24.41 | 47.94 | 34.04 | 71.23 | 4365 | 22 |
| 91.385704 | 24.23 | 49.05 | 38.89 | 73.37 | 4430 | 22 |
| 91.456184 | 22.01 | 50.24 | 36.93 | 73.91 | 4334 | 22 |
| 91.527962 | 28.48 | 54.05 | 43.09 | 87.14 | 4371 | 32 |
| 91.599442 | 25.65 | 55.23 | 38.44 | 82.76 | 4296 | 32 |
| 91.670090 | 23.33 | 55.72 | 28.24 | 76.27 | 4074 | 12 |
| 91.739517 | 22.20 | 60.21 | 30.51 | 81.59 | 4175 | 12 |
| 91.810326 | 28.09 | 63.81 | 32.10 | 87.06 | 4270 | 18 |
| 91.882034 | 33.12 | 52.88 | 43.57 | 86.30 | 4486 | 22 |
| 91.953644 | 42.45 | 49.27 | 35.70 | 82.90 | 4608 | 22 |
| 91.992271 | 25.50 | 45.54 | 16.79 | 57.71 | 697 | 22 |
| 92.029991 | 45.47 | 49.58 | 33.64 | 83.27 | 3618 | 12 |
| 92.094986 | 43.22 | 49.99 | 38.29 | 84.77 | 4013 | 12 |
| 92.165741 | 38.63 | 51.19 | 28.06 | 76.82 | 4102 | 9 |
| 92.235764 | 38.61 | 45.93 | 26.71 | 71.36 | 4235 | 9 |

| | | | | | | |
|-----------|-------|-------|-------|--------|------|----|
| 92.305603 | 33.27 | 42.03 | 19.96 | 63.52 | 4373 | 6 |
| 92.375984 | 29.97 | 34.01 | 21.49 | 56.84 | 4419 | 7 |
| 92.446594 | 25.36 | 35.06 | 22.33 | 55.72 | 4329 | 7 |
| 92.517998 | 30.34 | 39.92 | 28.84 | 66.78 | 4346 | 7 |
| 92.589722 | 27.44 | 47.88 | 20.69 | 65.76 | 4311 | 7 |
| 92.660507 | 28.79 | 49.23 | 23.57 | 68.52 | 4107 | 18 |
| 92.729897 | 37.29 | 55.51 | 31.14 | 84.70 | 4143 | 18 |
| 92.800545 | 29.36 | 52.64 | 28.29 | 76.04 | 4273 | 27 |
| 92.872299 | 28.27 | 45.06 | 29.77 | 69.60 | 4472 | 27 |
| 92.943855 | 36.38 | 55.59 | 40.64 | 87.18 | 4621 | 18 |
| 92.986900 | 43.07 | 60.72 | 44.91 | 94.94 | 1078 | 18 |
| 93.023216 | 39.60 | 60.05 | 55.02 | 101.27 | 3301 | 27 |
| 93.085228 | 38.93 | 60.38 | 55.84 | 102.69 | 4015 | 27 |
| 93.156090 | 35.90 | 56.26 | 43.77 | 87.38 | 4092 | 22 |
| 93.226112 | 35.05 | 48.60 | 34.55 | 75.38 | 4215 | 22 |
| 93.296028 | 30.34 | 54.50 | 33.72 | 78.69 | 4354 | 18 |
| 93.366249 | 22.76 | 38.18 | 32.71 | 61.81 | 4425 | 18 |
| 93.436867 | 18.44 | 38.88 | 34.24 | 60.57 | 4352 | 12 |
| 93.507965 | 36.40 | 67.94 | 90.99 | 132.19 | 4299 | 15 |
| 93.579941 | 27.25 | 58.18 | 59.71 | 101.19 | 4322 | 15 |
| 93.650879 | 22.51 | 56.68 | 23.52 | 70.12 | 4140 | 5 |
| 93.720230 | 25.33 | 59.97 | 27.50 | 76.30 | 4114 | 5 |
| 93.790825 | 28.78 | 56.63 | 26.45 | 76.21 | 4267 | 7 |
| 93.862305 | 26.29 | 55.61 | 24.60 | 73.75 | 4467 | 7 |
| 93.934113 | 31.06 | 57.41 | 50.05 | 92.01 | 4616 | 15 |
| 93.984932 | 36.85 | 57.33 | 42.89 | 90.25 | 1918 | 15 |
| 94.019630 | 28.77 | 57.00 | 32.80 | 83.32 | 2487 | 12 |
| 94.074905 | 30.97 | 59.17 | 33.15 | 83.61 | 4131 | 12 |
| 94.146378 | 28.90 | 53.86 | 29.40 | 76.73 | 4050 | 12 |
| 94.216583 | 27.79 | 52.90 | 28.35 | 76.21 | 4198 | 12 |
| 94.286446 | 26.22 | 46.71 | 22.39 | 66.63 | 4349 | 6 |
| 94.356598 | 23.12 | 43.20 | 16.70 | 57.80 | 4424 | 6 |
| 94.427185 | 22.54 | 49.56 | 25.11 | 67.49 | 4374 | 6 |
| 94.497894 | 25.51 | 49.15 | 28.58 | 69.78 | 4249 | 6 |
| 94.570183 | 27.37 | 57.33 | 22.16 | 73.01 | 4352 | 7 |
| 94.641159 | 24.41 | 56.84 | 20.28 | 70.17 | 4173 | 9 |
| 94.710732 | 22.09 | 58.62 | 20.15 | 69.91 | 4059 | 9 |
| 94.781044 | 25.98 | 55.47 | 21.69 | 70.32 | 4255 | 5 |
| 94.852463 | 24.62 | 51.62 | 26.20 | 69.34 | 4354 | 5 |
| 94.924133 | 30.48 | 48.85 | 49.24 | 86.28 | 4565 | 15 |
| 94.981171 | 29.01 | 64.33 | 37.12 | 88.99 | 2755 | 15 |
| 95.017029 | 42.29 | 52.87 | 72.85 | 110.25 | 1686 | 48 |
| 95.064835 | 29.29 | 65.97 | 48.74 | 94.66 | 4190 | 48 |
| 95.136780 | 27.46 | 54.77 | 30.61 | 78.02 | 4051 | 22 |
| 95.206978 | 27.56 | 47.97 | 23.89 | 68.33 | 4187 | 22 |
| 95.276840 | 27.17 | 45.48 | 17.72 | 63.45 | 4328 | 9 |
| 95.346947 | 22.72 | 45.89 | 18.17 | 60.51 | 4410 | 9 |
| 95.417488 | 22.44 | 43.80 | 17.01 | 58.29 | 4389 | 5 |
| 95.488174 | 26.32 | 44.78 | 20.45 | 61.85 | 4267 | 5 |
| 95.560417 | 27.71 | 62.70 | 30.84 | 82.34 | 4377 | 22 |
| 95.631531 | 25.96 | 60.18 | 23.17 | 76.11 | 4209 | 15 |
| 95.701363 | 21.43 | 68.67 | 24.28 | 82.67 | 3974 | 15 |
| 95.771400 | 27.62 | 74.25 | 27.43 | 93.31 | 4243 | 39 |
| 95.842476 | 23.64 | 70.06 | 24.46 | 86.25 | 4288 | 39 |
| 95.914215 | 28.59 | 62.66 | 31.47 | 83.83 | 4526 | 15 |
| 95.975067 | 34.96 | 63.43 | 33.52 | 93.58 | 3264 | 15 |
| 96.011398 | 34.54 | 54.04 | 45.43 | 84.71 | 1252 | 27 |
| 96.054817 | 30.09 | 71.65 | 33.86 | 92.74 | 4233 | 27 |
| 96.127083 | 28.98 | 59.15 | 22.08 | 76.69 | 4034 | 32 |
| 96.197479 | 28.90 | 47.17 | 20.10 | 67.22 | 4162 | 32 |
| 96.267265 | 28.47 | 46.73 | 17.49 | 65.32 | 4318 | 6 |
| 96.337257 | 22.79 | 46.13 | 13.93 | 59.62 | 4381 | 6 |
| 96.407845 | 21.83 | 42.64 | 19.17 | 58.84 | 4402 | 3 |
| 96.478516 | 24.81 | 41.24 | 22.37 | 61.34 | 4280 | 3 |
| 96.550568 | 28.22 | 51.54 | 27.75 | 71.18 | 4378 | 3 |
| 96.621864 | 28.50 | 54.79 | 19.77 | 70.38 | 4241 | 3 |
| 96.692627 | 19.71 | 52.72 | 15.90 | 62.29 | 3659 | 6 |
| 96.761665 | 22.09 | 57.01 | 30.98 | 73.70 | 4227 | 5 |
| 96.832733 | 23.37 | 51.46 | 23.13 | 66.05 | 4288 | 5 |
| 96.904396 | 29.74 | 54.42 | 31.03 | 76.63 | 4519 | 4 |
| 96.969070 | 32.23 | 48.54 | 23.12 | 71.08 | 3706 | 4 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|-----|
| 97.004517 | 45.05 | 38.22 | 32.42 | 71.06 | 770 | 6 |
| 97.044952 | 32.64 | 49.04 | 27.37 | 73.91 | 4246 | 6 |
| 97.118683 | 32.63 | 53.10 | 23.55 | 75.06 | 3870 | 6 |
| 97.187904 | 29.54 | 53.00 | 24.15 | 73.81 | 4146 | 32 |
| 97.257767 | 26.97 | 57.01 | 27.45 | 76.65 | 4286 | 12 |
| 97.327614 | 22.31 | 51.57 | 18.13 | 66.85 | 4365 | 12 |
| 97.398216 | 21.36 | 47.74 | 17.19 | 59.52 | 4415 | 9 |
| 97.468834 | 24.05 | 40.66 | 20.12 | 58.96 | 4306 | 9 |
| 97.540749 | 28.46 | 53.98 | 30.97 | 74.38 | 4386 | 18 |
| 97.612129 | 26.80 | 55.47 | 23.95 | 71.38 | 4249 | 18 |
| 97.682465 | 28.31 | 61.14 | 16.66 | 75.55 | 3993 | 111 |
| 97.752052 | 28.45 | 103.06 | 87.13 | 154.53 | 4197 | 236 |
| 97.822952 | 43.61 | 189.01 | 99.53 | 245.84 | 4270 | 236 |
| 97.894539 | 62.14 | 232.04 | 100.33 | 298.00 | 4456 | 236 |
| 97.965843 | 92.59 | 292.84 | 143.10 | 374.87 | 4552 | 236 |
| 98.035240 | 74.68 | 259.93 | 94.70 | 311.30 | 4127 | 300 |
| 98.106651 | 65.55 | 187.06 | 39.36 | 214.87 | 4022 | 300 |
| 98.177269 | 52.81 | 125.52 | 53.84 | 160.41 | 4122 | 80 |
| 98.247231 | 54.16 | 124.32 | 70.95 | 170.88 | 4261 | 80 |
| 98.317039 | 48.48 | 127.23 | 67.53 | 166.14 | 4341 | 80 |
| 98.387619 | 44.98 | 114.80 | 57.88 | 147.23 | 4423 | 27 |
| 98.458160 | 35.18 | 105.27 | 47.56 | 131.40 | 4310 | 27 |
| 98.529945 | 34.07 | 98.11 | 45.40 | 125.62 | 4377 | 27 |
| 98.601410 | 30.64 | 94.15 | 30.32 | 114.17 | 4277 | 27 |
| 98.671982 | 29.56 | 96.62 | 25.08 | 115.60 | 4067 | 32 |
| 98.741432 | 32.32 | 96.87 | 32.19 | 123.87 | 4177 | 32 |
| 98.812271 | 37.15 | 85.80 | 38.27 | 117.27 | 4276 | 22 |
| 98.884071 | 40.21 | 80.03 | 31.78 | 107.86 | 4497 | 22 |
| 98.955681 | 46.59 | 72.81 | 36.96 | 107.17 | 4607 | 22 |
| 98.994522 | 31.00 | 60.00 | 25.09 | 82.25 | 726 | 22 |
| 99.032127 | 45.50 | 66.16 | 32.28 | 98.44 | 3588 | 9 |
| 99.096909 | 41.20 | 63.53 | 44.78 | 100.70 | 4023 | 9 |
| 99.167625 | 36.76 | 57.35 | 44.91 | 93.22 | 4106 | 9 |
| 99.237617 | 38.23 | 54.52 | 52.91 | 99.73 | 4240 | 9 |
| 99.307549 | 31.73 | 56.67 | 51.17 | 95.86 | 4373 | 15 |
| 99.377960 | 27.70 | 56.05 | 56.26 | 95.75 | 4422 | 15 |
| 99.448517 | 22.35 | 53.32 | 50.71 | 87.05 | 4326 | 15 |
| 99.520042 | 24.93 | 56.68 | 52.67 | 93.51 | 4360 | 7 |
| 99.591652 | 24.47 | 63.44 | 46.77 | 94.56 | 4307 | 7 |
| 99.662422 | 20.40 | 56.92 | 43.86 | 86.32 | 4099 | 6 |
| 99.809074 | 30.87 | 51.11 | 42.35 | 85.44 | 3503 | 9 |
| 99.874313 | 31.08 | 53.28 | 47.62 | 90.97 | 4472 | 9 |
| 99.945854 | 39.10 | 53.96 | 48.79 | 94.34 | 4621 | 12 |
| 99.987244 | 44.20 | 61.13 | 61.32 | 114.28 | 964 | 12 |
| 100.024429 | 37.40 | 46.21 | 32.21 | 76.44 | 3399 | 9 |
| 100.087151 | 36.06 | 54.68 | 39.18 | 84.39 | 4021 | 9 |
| 100.158012 | 33.00 | 50.34 | 30.50 | 73.50 | 4092 | 15 |
| 100.228065 | 33.18 | 42.81 | 22.04 | 64.59 | 4219 | 15 |
| 100.297920 | 29.39 | 38.21 | 20.21 | 59.03 | 4358 | 9 |
| 100.368217 | 24.25 | 34.00 | 22.58 | 53.83 | 4421 | 9 |
| 100.438850 | 19.57 | 36.80 | 26.95 | 55.69 | 4350 | 6 |
| 100.510078 | 22.23 | 42.97 | 37.00 | 68.88 | 4334 | 18 |
| 100.581863 | 24.79 | 56.28 | 30.29 | 76.41 | 4316 | 18 |
| 100.652824 | 20.73 | 51.22 | 30.30 | 70.28 | 4131 | 15 |
| 100.722137 | 20.06 | 55.70 | 35.52 | 79.14 | 4126 | 15 |
| 100.792824 | 25.26 | 59.33 | 26.23 | 78.33 | 4257 | 22 |
| 100.864319 | 28.75 | 57.39 | 38.03 | 85.51 | 4457 | 22 |
| 100.936043 | 36.05 | 62.28 | 42.65 | 93.51 | 4605 | 22 |
| 100.985451 | 35.50 | 62.46 | 43.33 | 98.51 | 1736 | 22 |
| 101.020241 | 38.71 | 69.64 | 51.72 | 107.36 | 2663 | 22 |
| 101.078728 | 35.51 | 61.33 | 55.66 | 103.57 | 3890 | 22 |
| 101.148323 | 31.65 | 60.97 | 52.71 | 95.79 | 4073 | 27 |
| 101.218521 | 33.38 | 52.86 | 41.30 | 83.82 | 4205 | 27 |
| 101.288353 | 31.09 | 53.70 | 36.57 | 81.04 | 4347 | 22 |
| 101.358574 | 23.01 | 46.07 | 38.34 | 72.45 | 4425 | 22 |
| 101.429122 | 17.01 | 41.73 | 31.08 | 60.85 | 4362 | 18 |
| 101.499794 | 18.89 | 49.47 | 30.74 | 66.78 | 4240 | 18 |
| 101.572121 | 23.68 | 57.27 | 23.37 | 72.18 | 4348 | 15 |
| 101.643127 | 21.59 | 58.85 | 21.63 | 72.49 | 4160 | 15 |
| 101.712578 | 20.40 | 54.38 | 24.57 | 70.69 | 4078 | 15 |
| 101.783043 | 25.43 | 51.37 | 27.07 | 70.90 | 4260 | 12 |

| | | | | | | |
|------------|-------|-------|-------|-------|------|----|
| 101.854446 | 26.70 | 46.37 | 34.60 | 73.62 | 4381 | 12 |
| 101.926247 | 34.74 | 56.07 | 42.03 | 87.68 | 4602 | 18 |
| 101.981934 | 32.53 | 57.63 | 33.75 | 81.69 | 2580 | 18 |
| 102.017281 | 39.51 | 34.12 | 13.20 | 61.13 | 1858 | 6 |
| 102.066772 | 34.54 | 52.91 | 32.11 | 77.66 | 4175 | 6 |
| 102.138680 | 32.12 | 51.76 | 27.37 | 72.83 | 4065 | 15 |
| 102.208961 | 31.57 | 48.25 | 36.39 | 74.76 | 4196 | 15 |
| 102.278809 | 31.30 | 45.03 | 24.40 | 65.50 | 4345 | 18 |
| 102.348915 | 23.12 | 38.65 | 32.34 | 62.53 | 4410 | 18 |
| 102.419418 | 18.69 | 34.32 | 25.48 | 52.20 | 4384 | 6 |
| 102.490173 | 17.76 | 37.33 | 27.17 | 55.53 | 4261 | 6 |
| 102.562370 | 23.15 | 47.68 | 25.26 | 65.27 | 4366 | 7 |
| 102.633438 | 21.66 | 53.13 | 22.86 | 67.32 | 4192 | 6 |
| 102.703102 | 18.65 | 50.24 | 24.21 | 64.93 | 4009 | 6 |
| 102.773354 | 23.95 | 47.46 | 26.71 | 68.48 | 4245 | 9 |
| 102.844444 | 26.66 | 45.53 | 25.17 | 67.06 | 4298 | 9 |
| 102.916229 | 32.32 | 49.47 | 29.01 | 72.84 | 4530 | 5 |
| 102.975685 | 31.96 | 49.76 | 27.88 | 72.65 | 3085 | 5 |
| 103.012314 | 39.90 | 35.61 | 10.09 | 58.28 | 1371 | 9 |
| 103.056854 | 33.03 | 56.14 | 33.67 | 81.21 | 4227 | 9 |
| 103.128967 | 32.88 | 52.95 | 34.79 | 78.02 | 4051 | 12 |
| 103.199425 | 31.73 | 45.72 | 33.66 | 71.65 | 4172 | 12 |
| 103.269234 | 32.23 | 39.43 | 24.63 | 62.83 | 4317 | 9 |
| 103.339249 | 23.96 | 36.84 | 24.00 | 57.71 | 4390 | 9 |
| 103.409805 | 20.29 | 36.11 | 23.53 | 53.53 | 4397 | 2 |
| 103.480453 | 18.81 | 36.30 | 27.22 | 57.37 | 4282 | 2 |
| 103.552559 | 22.43 | 44.80 | 20.41 | 60.74 | 4375 | 4 |
| 103.623795 | 21.99 | 46.75 | 17.18 | 60.28 | 4222 | 4 |
| 103.693726 | 17.12 | 42.91 | 17.65 | 53.33 | 3907 | 6 |
| 103.763657 | 21.47 | 44.76 | 22.05 | 59.84 | 4232 | 5 |
| 103.834679 | 23.55 | 42.64 | 25.86 | 61.12 | 4283 | 5 |
| 103.906425 | 28.99 | 41.49 | 27.83 | 65.54 | 4523 | 6 |
| 103.969559 | 31.85 | 45.32 | 27.33 | 68.71 | 3520 | 6 |
| 104.005569 | 46.42 | 33.58 | 11.44 | 60.96 | 950 | 9 |
| 104.046982 | 34.49 | 52.38 | 33.17 | 78.55 | 4233 | 9 |
| 104.119308 | 34.27 | 55.00 | 38.60 | 82.71 | 4027 | 9 |
| 104.189827 | 31.41 | 44.54 | 31.64 | 68.55 | 4149 | 22 |
| 104.259712 | 32.04 | 42.53 | 25.04 | 64.79 | 4287 | 7 |
| 104.329597 | 23.96 | 37.69 | 29.17 | 60.34 | 4372 | 7 |
| 104.400177 | 21.16 | 34.54 | 22.91 | 51.90 | 4412 | 4 |
| 104.470772 | 19.28 | 35.21 | 24.75 | 54.21 | 4296 | 4 |
| 104.542778 | 23.34 | 45.11 | 24.74 | 64.42 | 4386 | 3 |
| 104.614075 | 23.17 | 49.49 | 20.06 | 63.82 | 4248 | 3 |
| 104.684303 | 19.19 | 44.22 | 17.71 | 56.04 | 3976 | 2 |
| 104.753983 | 21.09 | 45.87 | 22.58 | 60.51 | 4211 | 0 |
| 104.824944 | 24.40 | 40.05 | 25.08 | 60.85 | 4287 | 0 |
| 104.896629 | 28.23 | 47.72 | 29.35 | 70.15 | 4515 | 0 |
| 104.966461 | 30.81 | 44.24 | 25.75 | 67.89 | 4367 | 0 |
| 105.000710 | 22.49 | 62.00 | 22.16 | 69.74 | 117 | 0 |
| 105.037117 | 25.58 | 44.90 | 26.87 | 66.74 | 4255 | 0 |
| 105.109573 | 25.50 | 45.28 | 28.01 | 67.02 | 4023 | 0 |
| 105.180222 | 24.70 | 42.35 | 25.54 | 62.42 | 4121 | 2 |
| 105.250130 | 22.55 | 38.63 | 21.30 | 55.93 | 4266 | 2 |
| 105.319954 | 19.50 | 40.03 | 20.49 | 54.32 | 4350 | 2 |
| 105.390556 | 18.26 | 35.39 | 20.01 | 49.70 | 4422 | 3 |
| 105.461029 | 19.51 | 34.72 | 23.14 | 52.50 | 4323 | 3 |
| 105.532906 | 23.54 | 42.44 | 24.83 | 61.27 | 4372 | 2 |
| 105.604340 | 27.59 | 47.05 | 17.75 | 63.56 | 4276 | 2 |
| 105.674919 | 24.21 | 47.30 | 17.38 | 61.27 | 4062 | 3 |
| 105.744331 | 27.97 | 51.53 | 25.77 | 70.24 | 4184 | 3 |
| 105.815231 | 27.54 | 50.49 | 24.64 | 68.46 | 4268 | 5 |
| 105.886978 | 27.08 | 46.93 | 26.46 | 66.90 | 4525 | 2 |
| 105.958504 | 29.50 | 48.84 | 23.46 | 69.34 | 4616 | 2 |
| 105.996529 | 37.99 | 48.08 | 15.98 | 72.09 | 593 | 2 |
| 106.033821 | 25.60 | 48.48 | 26.96 | 69.68 | 3670 | 2 |
| 106.099861 | 25.76 | 45.00 | 29.36 | 68.67 | 4033 | 2 |
| 106.170616 | 24.75 | 44.15 | 24.11 | 63.88 | 4114 | 4 |
| 106.240593 | 21.58 | 40.80 | 19.01 | 56.97 | 4246 | 4 |
| 106.310425 | 19.37 | 42.75 | 19.44 | 56.78 | 4376 | 4 |
| 106.380905 | 18.95 | 38.74 | 20.63 | 53.85 | 4429 | 6 |
| 106.451469 | 20.21 | 38.85 | 19.72 | 54.02 | 4319 | 6 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 106.522995 | 23.99 | 43.70 | 24.45 | 62.58 | 4357 | 5 |
| 106.594627 | 30.32 | 49.37 | 18.84 | 68.02 | 4309 | 5 |
| 106.665398 | 27.17 | 50.18 | 16.83 | 65.64 | 4102 | 6 |
| 106.734711 | 34.41 | 49.36 | 22.09 | 71.86 | 4166 | 6 |
| 106.805496 | 33.53 | 55.25 | 23.77 | 78.58 | 4270 | 9 |
| 106.877235 | 29.13 | 54.53 | 32.97 | 79.21 | 4488 | 12 |
| 106.948807 | 28.27 | 58.52 | 38.28 | 86.30 | 4615 | 12 |
| 106.989853 | 36.80 | 93.70 | 21.59 | 109.35 | 927 | 12 |
| 107.026947 | 24.09 | 53.06 | 36.21 | 79.19 | 3435 | 18 |
| 107.090149 | 23.70 | 63.29 | 41.75 | 89.94 | 4026 | 18 |
| 107.160950 | 23.84 | 67.01 | 45.30 | 93.24 | 4094 | 32 |
| 107.231018 | 24.97 | 48.82 | 32.36 | 72.84 | 4232 | 32 |
| 107.300835 | 20.55 | 46.60 | 25.54 | 65.38 | 4358 | 32 |
| 107.371178 | 23.69 | 64.17 | 45.28 | 91.63 | 4425 | 32 |
| 107.441780 | 28.34 | 69.56 | 43.38 | 94.28 | 4343 | 32 |
| 107.513069 | 29.84 | 57.94 | 33.44 | 81.19 | 4331 | 32 |
| 107.584839 | 38.04 | 60.33 | 30.98 | 87.40 | 4322 | 32 |
| 107.655762 | 31.99 | 56.55 | 16.06 | 73.38 | 4121 | 12 |
| 107.725060 | 37.50 | 71.80 | 24.44 | 92.38 | 4134 | 12 |
| 107.795738 | 35.57 | 52.77 | 29.78 | 80.84 | 4264 | 9 |
| 107.867233 | 28.81 | 56.91 | 28.28 | 78.99 | 4480 | 9 |
| 107.938995 | 29.87 | 58.57 | 26.14 | 79.17 | 4611 | 7 |
| 107.986412 | 39.94 | 45.60 | 43.68 | 87.41 | 1510 | 7 |
| 108.021355 | 24.26 | 54.51 | 31.35 | 75.64 | 2907 | 15 |
| 108.080116 | 24.74 | 47.82 | 42.98 | 79.32 | 4064 | 15 |
| 108.151329 | 24.41 | 44.03 | 43.82 | 75.11 | 4084 | 15 |
| 108.221451 | 22.27 | 39.39 | 45.13 | 72.08 | 4207 | 15 |
| 108.291283 | 21.45 | 43.44 | 47.24 | 76.03 | 4348 | 27 |
| 108.361473 | 23.85 | 38.76 | 50.94 | 75.84 | 4427 | 27 |
| 108.432076 | 24.96 | 32.03 | 45.68 | 68.54 | 4364 | 12 |
| 108.502869 | 25.68 | 39.96 | 52.15 | 78.05 | 4249 | 4 |
| 108.577560 | 32.69 | 45.55 | 42.24 | 79.73 | 4000 | 4 |
| 108.646065 | 32.12 | 52.83 | 46.48 | 86.84 | 4161 | 7 |
| 108.792404 | 37.30 | 51.81 | 46.44 | 90.32 | 3526 | 5 |
| 108.857468 | 30.09 | 56.06 | 46.63 | 89.73 | 4404 | 5 |
| 108.929237 | 31.38 | 48.85 | 48.40 | 86.26 | 4615 | 7 |
| 108.983185 | 32.97 | 62.11 | 47.94 | 94.72 | 2341 | 7 |
| 109.018135 | 29.91 | 44.32 | 19.14 | 64.16 | 2090 | 5 |
| 109.069794 | 26.62 | 48.70 | 27.57 | 70.05 | 4169 | 5 |
| 109.141670 | 24.70 | 48.09 | 27.61 | 68.51 | 4068 | 9 |
| 109.211922 | 24.83 | 39.22 | 22.45 | 59.43 | 4201 | 9 |
| 109.281700 | 22.87 | 37.58 | 18.87 | 54.83 | 4342 | 4 |
| 109.351830 | 20.78 | 36.82 | 21.93 | 53.70 | 4418 | 4 |
| 109.422371 | 20.40 | 33.62 | 17.84 | 48.12 | 4379 | 2 |
| 109.493126 | 23.12 | 34.02 | 24.78 | 56.10 | 4260 | 2 |
| 109.565338 | 28.99 | 43.40 | 21.08 | 63.70 | 4362 | 3 |
| 109.636421 | 28.43 | 47.40 | 19.85 | 64.86 | 4186 | 3 |
| 109.705971 | 32.37 | 48.96 | 20.23 | 68.20 | 4019 | 3 |
| 109.776367 | 32.27 | 52.97 | 29.42 | 78.31 | 4247 | 12 |
| 109.847397 | 25.80 | 53.35 | 27.48 | 73.50 | 4302 | 12 |
| 109.919273 | 29.97 | 55.32 | 28.90 | 77.65 | 4546 | 6 |
| 109.977371 | 28.49 | 55.65 | 38.79 | 84.06 | 2915 | 6 |
| 110.013359 | 34.25 | 37.76 | 13.37 | 57.98 | 1486 | 15 |
| 110.058823 | 25.11 | 51.02 | 31.72 | 74.40 | 4206 | 15 |
| 110.130928 | 25.20 | 53.51 | 44.04 | 83.70 | 4056 | 27 |
| 110.201355 | 26.08 | 47.78 | 26.47 | 69.40 | 4162 | 27 |
| 110.271133 | 23.59 | 37.72 | 14.86 | 53.24 | 4318 | 6 |
| 110.341225 | 21.58 | 38.21 | 15.84 | 52.68 | 4398 | 6 |
| 110.411781 | 23.15 | 34.87 | 21.97 | 53.29 | 4396 | 6 |
| 110.482452 | 25.26 | 36.17 | 27.18 | 60.58 | 4271 | 6 |
| 110.554619 | 32.22 | 45.04 | 27.31 | 71.81 | 4375 | 15 |
| 110.625763 | 31.13 | 48.95 | 23.17 | 70.09 | 4216 | 15 |
| 110.695778 | 29.67 | 49.00 | 19.32 | 66.02 | 3901 | 15 |
| 110.765648 | 30.97 | 58.50 | 30.47 | 82.71 | 4236 | 6 |
| 110.836647 | 25.27 | 55.12 | 23.84 | 73.05 | 4284 | 6 |
| 110.908485 | 30.93 | 51.00 | 27.47 | 73.67 | 4515 | 6 |
| 110.969467 | 33.34 | 59.88 | 31.01 | 85.10 | 3282 | 6 |
| 111.006622 | 26.57 | 27.87 | 44.85 | 65.42 | 1127 | 15 |
| 111.048950 | 24.53 | 53.72 | 42.94 | 81.74 | 4236 | 15 |
| 111.121239 | 24.44 | 50.62 | 43.58 | 80.82 | 4034 | 15 |
| 111.191772 | 25.62 | 42.13 | 46.85 | 77.11 | 4155 | 18 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 111.261658 | 21.96 | 37.90 | 46.64 | 70.91 | 4296 | 18 |
| 111.331589 | 18.96 | 38.74 | 51.28 | 73.58 | 4378 | 18 |
| 111.402161 | 17.95 | 34.20 | 50.70 | 70.23 | 4407 | 7 |
| 111.472778 | 18.88 | 34.38 | 49.56 | 70.26 | 4294 | 7 |
| 111.544777 | 24.51 | 43.71 | 48.12 | 76.57 | 4381 | 15 |
| 111.616051 | 24.49 | 51.88 | 46.86 | 83.19 | 4246 | 15 |
| 111.763023 | 24.55 | 62.34 | 41.36 | 88.24 | 3413 | 9 |
| 111.826897 | 24.02 | 48.70 | 52.94 | 83.25 | 4280 | 9 |
| 111.898643 | 26.94 | 40.48 | 51.35 | 79.53 | 4516 | 6 |
| 111.967163 | 31.76 | 43.49 | 47.84 | 81.33 | 4178 | 6 |
| 112.001747 | 46.37 | 53.47 | 18.31 | 73.64 | 293 | 12 |
| 112.039085 | 34.11 | 47.47 | 29.06 | 72.80 | 4253 | 12 |
| 112.111542 | 33.86 | 46.61 | 32.03 | 73.20 | 4026 | 12 |
| 112.182175 | 28.81 | 41.60 | 25.18 | 63.26 | 4132 | 5 |
| 112.252098 | 29.50 | 39.36 | 21.33 | 58.49 | 4269 | 3 |
| 112.321930 | 21.22 | 38.15 | 22.60 | 55.33 | 4353 | 3 |
| 112.392525 | 17.24 | 35.38 | 27.75 | 52.59 | 4422 | 22 |
| 112.463013 | 17.71 | 32.61 | 26.49 | 52.01 | 4316 | 22 |
| 112.534943 | 22.63 | 41.82 | 24.24 | 60.11 | 4376 | 12 |
| 112.606316 | 23.81 | 47.33 | 16.83 | 60.32 | 4276 | 12 |
| 112.676888 | 19.05 | 42.25 | 15.27 | 53.00 | 4051 | 12 |
| 112.746323 | 19.28 | 39.96 | 20.66 | 53.90 | 4198 | 12 |
| 112.817207 | 21.88 | 41.83 | 21.93 | 57.59 | 4266 | 6 |
| 112.888969 | 23.11 | 46.01 | 28.66 | 64.92 | 4528 | 5 |
| 112.960602 | 30.35 | 49.51 | 23.80 | 68.72 | 4633 | 5 |
| 112.997559 | 25.66 | 35.15 | 12.88 | 51.00 | 414 | 5 |
| 113.034111 | 31.82 | 45.31 | 42.55 | 78.56 | 3806 | 4 |
| 113.101814 | 32.79 | 46.38 | 44.86 | 80.82 | 4026 | 4 |
| 113.172585 | 28.81 | 43.86 | 43.05 | 74.34 | 4111 | 6 |
| 113.242546 | 28.33 | 40.28 | 44.49 | 72.32 | 4250 | 6 |
| 113.312340 | 21.43 | 35.21 | 44.95 | 67.30 | 4354 | 7 |
| 113.382904 | 18.52 | 30.58 | 49.17 | 67.17 | 4429 | 7 |
| 113.453461 | 18.06 | 30.71 | 46.86 | 64.56 | 4307 | 7 |
| 113.525116 | 22.32 | 37.66 | 49.73 | 72.89 | 4376 | 6 |
| 113.676102 | 17.68 | 41.09 | 44.64 | 69.40 | 3177 | 3 |
| 113.736633 | 19.56 | 44.17 | 53.47 | 79.39 | 4169 | 3 |
| 113.807434 | 19.40 | 45.18 | 50.59 | 78.41 | 4270 | 4 |
| 113.879295 | 22.65 | 46.81 | 52.67 | 82.22 | 4501 | 4 |
| 113.950775 | 27.28 | 48.28 | 46.99 | 80.12 | 4617 | 4 |
| 113.991272 | 27.50 | 59.66 | 79.39 | 109.13 | 865 | 4 |
| 114.028526 | 30.49 | 42.15 | 25.98 | 66.05 | 3468 | 4 |
| 114.092133 | 29.25 | 42.67 | 27.31 | 66.90 | 4028 | 4 |
| 114.162941 | 26.60 | 42.90 | 25.24 | 63.87 | 4103 | 3 |
| 114.232941 | 26.40 | 39.03 | 20.04 | 57.10 | 4234 | 3 |
| 114.302834 | 19.84 | 41.97 | 21.68 | 57.49 | 4373 | 9 |
| 114.373161 | 15.96 | 34.44 | 22.38 | 49.26 | 4425 | 9 |
| 114.443764 | 17.35 | 31.03 | 21.78 | 47.52 | 4333 | 7 |
| 114.515137 | 20.01 | 36.02 | 25.98 | 55.24 | 4345 | 5 |
| 114.586876 | 23.12 | 45.26 | 17.92 | 59.29 | 4321 | 5 |
| 114.657745 | 19.69 | 44.63 | 18.71 | 56.99 | 4127 | 7 |
| 114.727013 | 19.65 | 42.47 | 27.21 | 60.55 | 4140 | 7 |
| 114.797745 | 22.72 | 42.54 | 27.56 | 61.00 | 4269 | 5 |
| 114.869240 | 23.90 | 45.01 | 23.32 | 62.51 | 4512 | 5 |
| 114.941032 | 26.71 | 44.50 | 23.78 | 64.39 | 4623 | 7 |
| 114.986710 | 32.09 | 44.54 | 27.05 | 71.80 | 1325 | 7 |
| 115.022079 | 27.13 | 40.58 | 16.20 | 58.55 | 3069 | 6 |
| 115.082153 | 28.22 | 43.38 | 23.57 | 65.03 | 4058 | 6 |
| 115.153297 | 26.28 | 44.74 | 22.64 | 63.98 | 4087 | 18 |
| 115.223389 | 22.90 | 47.57 | 34.82 | 71.32 | 4210 | 18 |
| 115.293251 | 19.92 | 41.50 | 27.18 | 60.36 | 4356 | 27 |
| 115.363472 | 15.56 | 33.14 | 24.44 | 49.10 | 4427 | 27 |
| 115.434067 | 14.60 | 39.16 | 27.13 | 56.14 | 4356 | 27 |
| 115.505173 | 19.21 | 54.01 | 40.61 | 80.55 | 4186 | 56 |
| 115.577164 | 26.64 | 74.49 | 34.20 | 96.84 | 4338 | 56 |
| 115.648087 | 21.13 | 57.72 | 17.66 | 71.42 | 4150 | 15 |
| 115.717422 | 23.49 | 54.43 | 24.66 | 71.89 | 4102 | 15 |
| 115.788010 | 27.24 | 50.87 | 27.47 | 73.70 | 4272 | 7 |
| 115.859467 | 24.56 | 51.81 | 24.27 | 71.32 | 4441 | 7 |
| 115.931259 | 29.51 | 58.35 | 28.84 | 79.17 | 4610 | 9 |
| 115.983932 | 30.26 | 65.18 | 32.04 | 88.12 | 2165 | 9 |
| 116.018654 | 28.71 | 51.28 | 36.00 | 78.94 | 2272 | 6 |

| | | | | | | |
|------------|-------|-------|-------|-------|------|----|
| 116.071785 | 26.16 | 52.16 | 42.82 | 81.59 | 4178 | 6 |
| 116.143623 | 23.91 | 48.16 | 42.14 | 77.74 | 4067 | 2 |
| 116.213829 | 24.38 | 40.18 | 42.56 | 72.60 | 4195 | 2 |
| 116.283707 | 23.06 | 36.99 | 47.59 | 72.45 | 4347 | 3 |
| 116.424385 | 17.75 | 35.67 | 48.03 | 68.92 | 4377 | 9 |
| 116.495102 | 21.76 | 39.03 | 46.01 | 71.95 | 4256 | 9 |
| 116.567375 | 26.93 | 48.67 | 45.32 | 79.27 | 4354 | 6 |
| 116.638382 | 25.01 | 50.02 | 48.33 | 82.24 | 4178 | 6 |
| 116.707939 | 29.89 | 49.20 | 49.64 | 85.87 | 4043 | 6 |
| 116.778313 | 30.02 | 53.44 | 47.07 | 88.86 | 4259 | 7 |
| 116.849487 | 25.23 | 48.37 | 45.71 | 82.04 | 4348 | 7 |
| 116.921379 | 29.38 | 51.21 | 46.71 | 85.97 | 4578 | 4 |
| 116.979515 | 29.16 | 51.93 | 43.75 | 83.91 | 2928 | 4 |
| 117.015938 | 34.23 | 40.33 | 14.93 | 58.12 | 1524 | 0 |
| 117.061836 | 25.83 | 47.30 | 33.83 | 72.54 | 4211 | 0 |
| 117.133995 | 24.42 | 44.62 | 26.00 | 65.87 | 4051 | 0 |
| 117.204338 | 25.10 | 40.03 | 22.72 | 60.82 | 4177 | 0 |
| 117.274109 | 22.72 | 39.79 | 18.80 | 56.69 | 4330 | 4 |
| 117.344177 | 19.88 | 41.34 | 17.66 | 55.56 | 4402 | 4 |
| 117.414734 | 19.77 | 37.51 | 20.13 | 52.75 | 4394 | 3 |
| 117.485428 | 23.64 | 38.21 | 21.46 | 56.87 | 4265 | 3 |
| 117.557594 | 28.04 | 45.68 | 14.75 | 61.99 | 4377 | 3 |
| 117.628777 | 28.19 | 48.63 | 18.13 | 66.05 | 4206 | 0 |
| 117.698708 | 28.55 | 50.52 | 18.00 | 66.68 | 3918 | 0 |
| 117.768608 | 29.89 | 50.07 | 29.11 | 75.48 | 4247 | 3 |
| 117.839592 | 25.75 | 51.08 | 26.36 | 72.09 | 4289 | 3 |
| 117.911423 | 30.15 | 48.29 | 27.76 | 72.84 | 4519 | 3 |
| 117.971901 | 32.00 | 62.33 | 35.29 | 88.69 | 3213 | 3 |
| 118.008751 | 21.75 | 19.59 | 12.68 | 34.58 | 1233 | 15 |
| 118.051941 | 24.46 | 52.25 | 27.95 | 73.61 | 4226 | 15 |
| 118.124290 | 25.18 | 46.37 | 24.64 | 67.19 | 4037 | 15 |
| 118.194778 | 25.62 | 41.76 | 21.18 | 62.48 | 4158 | 6 |
| 118.264595 | 22.00 | 41.96 | 16.22 | 58.03 | 4302 | 7 |
| 118.334526 | 21.06 | 44.58 | 20.60 | 60.32 | 4384 | 7 |
| 118.405106 | 21.90 | 50.58 | 24.57 | 66.12 | 4399 | 12 |
| 118.475754 | 23.39 | 46.98 | 22.72 | 65.62 | 4288 | 12 |
| 118.547745 | 30.44 | 52.48 | 25.46 | 75.48 | 4376 | 9 |
| 118.619087 | 33.23 | 60.86 | 28.96 | 85.16 | 4240 | 9 |
| 118.689133 | 31.74 | 59.71 | 13.45 | 74.72 | 3940 | 15 |
| 118.758888 | 38.20 | 56.41 | 20.88 | 80.37 | 4226 | 12 |
| 118.829872 | 22.03 | 54.32 | 18.19 | 67.17 | 4287 | 12 |
| 118.901657 | 26.49 | 46.75 | 32.21 | 70.45 | 4515 | 27 |
| 118.968285 | 29.85 | 53.20 | 40.25 | 82.46 | 3951 | 27 |
| 119.003136 | 45.60 | 56.95 | 49.88 | 92.96 | 534 | 39 |
| 119.042168 | 26.47 | 59.54 | 48.06 | 93.81 | 4247 | 39 |
| 119.114616 | 28.34 | 50.82 | 48.04 | 84.57 | 4036 | 39 |
| 119.185165 | 26.86 | 47.17 | 47.30 | 81.45 | 4135 | 18 |
| 119.255066 | 26.21 | 37.78 | 46.68 | 73.31 | 4278 | 15 |
| 119.324898 | 18.72 | 36.93 | 45.37 | 68.08 | 4361 | 15 |
| 119.395485 | 15.50 | 38.33 | 50.86 | 76.68 | 4416 | 9 |
| 119.466003 | 17.70 | 37.87 | 43.75 | 68.43 | 4310 | 9 |
| 119.537941 | 21.64 | 42.84 | 45.27 | 73.22 | 4380 | 7 |
| 119.688263 | 14.76 | 43.43 | 37.10 | 67.40 | 3173 | 7 |
| 119.749245 | 22.21 | 53.32 | 45.28 | 83.63 | 4210 | 7 |
| 119.820129 | 22.67 | 46.32 | 43.83 | 77.44 | 4280 | 9 |
| 119.891884 | 26.01 | 46.69 | 52.50 | 86.87 | 4509 | 9 |
| 119.963493 | 29.85 | 49.09 | 43.72 | 83.37 | 4621 | 9 |
| 119.998955 | 18.61 | 71.64 | 31.86 | 84.28 | 176 | 9 |
| 120.034431 | 30.25 | 45.50 | 28.22 | 70.02 | 3921 | 12 |
| 120.103821 | 29.82 | 44.76 | 39.42 | 75.55 | 4028 | 12 |
| 120.174500 | 25.74 | 44.30 | 30.86 | 66.90 | 4111 | 12 |
| 120.244514 | 26.42 | 37.39 | 18.16 | 54.43 | 4249 | 12 |
| 120.314293 | 19.49 | 38.43 | 17.00 | 51.48 | 4336 | 6 |
| 120.384911 | 16.13 | 33.97 | 20.16 | 47.17 | 4429 | 9 |
| 120.535904 | 16.65 | 36.31 | 30.61 | 54.03 | 3384 | 15 |
| 120.590640 | 22.81 | 48.28 | 20.40 | 61.87 | 4292 | 15 |
| 120.669296 | 17.37 | 45.47 | 16.95 | 54.58 | 4080 | 12 |
| 120.738647 | 21.82 | 53.43 | 28.20 | 70.44 | 4180 | 12 |
| 120.809456 | 23.45 | 52.72 | 30.79 | 71.72 | 4284 | 12 |
| 120.881332 | 24.50 | 43.65 | 26.60 | 63.40 | 4503 | 22 |
| 120.952858 | 28.11 | 55.06 | 33.10 | 79.53 | 4624 | 22 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 120.991722 | 20.72 | 49.37 | 28.00 | 67.37 | 721 | 22 |
| 121.029350 | 28.65 | 51.00 | 27.28 | 73.36 | 3608 | 15 |
| 121.094116 | 25.48 | 47.82 | 38.54 | 76.12 | 4016 | 15 |
| 121.164940 | 23.86 | 47.94 | 32.81 | 70.51 | 4100 | 32 |
| 121.234955 | 26.17 | 40.02 | 23.25 | 60.68 | 4236 | 32 |
| 121.304848 | 21.05 | 38.84 | 19.45 | 54.41 | 4377 | 5 |
| 121.375183 | 16.35 | 35.81 | 22.32 | 49.96 | 4426 | 4 |
| 121.445801 | 15.79 | 35.85 | 16.78 | 47.25 | 4334 | 4 |
| 121.517166 | 19.59 | 39.21 | 22.76 | 54.77 | 4348 | 7 |
| 121.588921 | 22.73 | 47.59 | 16.52 | 60.40 | 4317 | 7 |
| 121.659744 | 20.20 | 47.55 | 21.71 | 62.40 | 4117 | 9 |
| 121.728996 | 24.50 | 50.97 | 29.28 | 70.50 | 4164 | 9 |
| 121.799744 | 26.25 | 49.53 | 26.66 | 68.67 | 4274 | 15 |
| 121.871284 | 25.45 | 47.38 | 28.24 | 67.72 | 4514 | 15 |
| 121.943100 | 28.59 | 43.01 | 21.55 | 63.92 | 4626 | 6 |
| 121.986816 | 39.80 | 46.53 | 28.43 | 77.83 | 1144 | 6 |
| 122.022835 | 25.38 | 41.57 | 21.86 | 61.43 | 3238 | 6 |
| 122.084259 | 25.84 | 46.28 | 29.91 | 69.12 | 4050 | 6 |
| 122.155289 | 24.77 | 49.63 | 37.62 | 75.47 | 4093 | 22 |
| 122.225380 | 24.81 | 39.91 | 25.63 | 61.39 | 4215 | 22 |
| 122.295235 | 21.72 | 40.34 | 22.14 | 57.20 | 4355 | 12 |
| 122.365402 | 16.72 | 34.58 | 19.73 | 47.65 | 4416 | 12 |
| 122.436287 | 16.44 | 36.64 | 16.81 | 48.07 | 3670 | 15 |
| 122.507607 | 24.30 | 43.18 | 28.82 | 64.07 | 3509 | 15 |
| 122.579132 | 21.67 | 53.33 | 17.49 | 64.79 | 4337 | 15 |
| 122.650070 | 18.20 | 56.18 | 16.70 | 65.19 | 4143 | 18 |
| 122.719353 | 19.58 | 52.66 | 23.51 | 66.52 | 4107 | 18 |
| 122.790024 | 22.53 | 50.54 | 33.55 | 71.80 | 4268 | 18 |
| 122.861504 | 27.63 | 55.36 | 28.50 | 74.21 | 4460 | 18 |
| 122.933205 | 34.08 | 61.46 | 24.19 | 81.89 | 4595 | 15 |
| 122.984627 | 36.27 | 58.28 | 30.31 | 82.31 | 1985 | 15 |
| 123.019257 | 33.37 | 65.30 | 52.32 | 102.23 | 2442 | 18 |
| 123.073845 | 38.38 | 53.39 | 37.90 | 84.80 | 4160 | 18 |
| 123.145599 | 35.21 | 45.04 | 42.96 | 79.74 | 4072 | 7 |
| 123.285637 | 31.39 | 37.47 | 45.97 | 74.55 | 4342 | 7 |
| 123.355835 | 22.75 | 31.90 | 45.63 | 67.49 | 4425 | 7 |
| 123.426376 | 19.08 | 42.41 | 43.22 | 72.35 | 4379 | 32 |
| 123.497093 | 17.74 | 44.73 | 50.28 | 77.85 | 4257 | 32 |
| 123.569344 | 22.78 | 52.01 | 47.44 | 82.53 | 4349 | 39 |
| 123.640381 | 18.92 | 51.30 | 47.08 | 79.98 | 4169 | 22 |
| 123.709862 | 20.42 | 54.58 | 54.66 | 89.95 | 4061 | 22 |
| 123.780327 | 23.91 | 53.87 | 52.88 | 87.96 | 4255 | 18 |
| 123.851601 | 26.12 | 52.26 | 51.46 | 88.55 | 4375 | 18 |
| 123.923462 | 34.08 | 59.28 | 53.68 | 101.89 | 4594 | 22 |
| 123.980789 | 32.07 | 52.72 | 52.77 | 92.08 | 2825 | 22 |
| 124.016815 | 45.97 | 36.86 | 11.19 | 63.47 | 1625 | 9 |
| 124.063866 | 34.55 | 42.75 | 27.86 | 69.98 | 4206 | 9 |
| 124.135971 | 32.30 | 45.77 | 26.03 | 69.07 | 4055 | 9 |
| 124.206329 | 29.85 | 44.94 | 26.71 | 65.76 | 4177 | 9 |
| 124.276131 | 29.19 | 41.11 | 23.28 | 60.72 | 4335 | 12 |
| 124.346169 | 21.04 | 34.37 | 19.07 | 49.37 | 4403 | 12 |
| 124.416710 | 17.99 | 32.93 | 20.89 | 46.73 | 4390 | 5 |
| 124.487381 | 20.97 | 34.29 | 25.92 | 55.15 | 4253 | 5 |
| 124.559608 | 23.42 | 44.15 | 19.60 | 59.00 | 4380 | 7 |
| 124.630737 | 23.41 | 47.22 | 20.13 | 61.34 | 4201 | 27 |
| 124.700600 | 18.26 | 45.91 | 18.51 | 56.38 | 3952 | 27 |
| 124.770599 | 22.40 | 57.11 | 31.77 | 79.37 | 4240 | 48 |
| 124.841599 | 22.49 | 57.44 | 36.05 | 81.41 | 4298 | 48 |
| 124.913429 | 30.95 | 54.30 | 34.13 | 80.83 | 4519 | 22 |
| 124.974167 | 34.85 | 53.27 | 38.31 | 85.83 | 3241 | 22 |
| 125.010811 | 36.55 | 29.04 | 15.01 | 52.52 | 1237 | 5 |
| 125.053970 | 31.01 | 51.02 | 30.83 | 75.44 | 4226 | 5 |
| 125.126282 | 32.31 | 44.65 | 27.17 | 68.92 | 4042 | 5 |
| 125.196747 | 29.22 | 38.99 | 22.50 | 60.00 | 4163 | 5 |
| 125.266548 | 28.83 | 38.51 | 20.52 | 57.95 | 4310 | 6 |
| 125.336563 | 21.55 | 37.77 | 21.21 | 53.69 | 4383 | 6 |
| 125.407104 | 19.08 | 35.24 | 21.01 | 49.54 | 4398 | 9 |
| 125.477753 | 19.51 | 33.67 | 29.87 | 55.61 | 4285 | 9 |
| 125.549767 | 23.38 | 47.72 | 27.80 | 65.33 | 4373 | 6 |
| 125.621086 | 22.47 | 48.65 | 25.61 | 64.12 | 4233 | 6 |
| 125.690994 | 16.55 | 44.83 | 17.20 | 54.29 | 3924 | 6 |

| | | | | | | |
|------------|-------|-------|-------|-------|------|----|
| 125.760963 | 18.41 | 44.71 | 22.14 | 58.03 | 4226 | 7 |
| 125.831902 | 23.42 | 42.24 | 25.28 | 60.19 | 4289 | 7 |
| 125.903702 | 32.16 | 43.82 | 36.49 | 72.35 | 4522 | 7 |
| 125.968864 | 35.17 | 45.11 | 33.29 | 73.26 | 3763 | 7 |
| 126.004181 | 52.82 | 36.76 | 18.52 | 70.09 | 711 | 7 |
| 126.044174 | 37.30 | 47.67 | 27.98 | 73.80 | 4234 | 7 |
| 126.116623 | 40.14 | 45.92 | 26.82 | 73.73 | 4031 | 7 |
| 126.187157 | 33.74 | 42.65 | 30.75 | 69.14 | 4141 | 7 |
| 126.257057 | 35.27 | 45.40 | 32.74 | 73.63 | 4279 | 18 |
| 126.326889 | 25.58 | 35.28 | 22.90 | 55.92 | 4358 | 18 |
| 126.397476 | 22.75 | 36.14 | 21.84 | 51.55 | 4410 | 7 |
| 126.468010 | 21.77 | 37.00 | 33.84 | 60.37 | 4304 | 7 |
| 126.539963 | 25.86 | 43.12 | 32.92 | 67.13 | 4385 | 12 |
| 126.611351 | 23.76 | 46.31 | 28.80 | 65.46 | 4271 | 12 |
| 126.681763 | 20.20 | 43.31 | 16.38 | 54.70 | 4020 | 5 |
| 126.751228 | 18.64 | 46.73 | 28.15 | 62.19 | 4216 | 7 |
| 126.822197 | 23.20 | 47.22 | 22.47 | 62.86 | 4289 | 7 |
| 126.893936 | 30.34 | 39.02 | 29.16 | 64.44 | 4515 | 15 |
| 126.965530 | 38.02 | 42.57 | 25.20 | 68.49 | 4614 | 15 |
| 127.035393 | 38.36 | 51.58 | 39.91 | 84.50 | 4146 | 18 |
| 127.106911 | 40.23 | 48.49 | 44.71 | 86.50 | 4024 | 18 |
| 127.177559 | 31.74 | 49.67 | 45.84 | 82.61 | 4114 | 18 |
| 127.247475 | 34.32 | 40.55 | 27.00 | 64.87 | 4263 | 18 |
| 127.317268 | 26.37 | 36.38 | 21.94 | 56.04 | 4346 | 6 |
| 127.387856 | 22.45 | 34.70 | 25.45 | 53.85 | 4418 | 6 |
| 127.458366 | 22.78 | 33.11 | 22.58 | 51.85 | 4326 | 6 |
| 127.530182 | 24.40 | 40.82 | 29.79 | 61.53 | 4377 | 9 |
| 127.601624 | 24.21 | 48.78 | 25.82 | 65.36 | 4287 | 9 |
| 127.672295 | 20.70 | 44.27 | 15.16 | 55.74 | 4075 | 7 |
| 127.741646 | 18.19 | 45.48 | 22.50 | 58.06 | 4176 | 7 |
| 127.812454 | 22.08 | 41.13 | 23.91 | 58.74 | 4283 | 6 |
| 127.884331 | 27.01 | 41.60 | 27.00 | 62.69 | 4503 | 15 |
| 127.955788 | 34.46 | 42.87 | 31.41 | 69.60 | 4624 | 15 |
| 127.994209 | 19.92 | 41.39 | 30.68 | 58.75 | 674 | 15 |
| 128.031418 | 38.75 | 50.49 | 40.05 | 84.65 | 3554 | 7 |
| 128.096130 | 35.38 | 43.53 | 34.95 | 74.48 | 4017 | 7 |
| 128.166916 | 29.43 | 44.28 | 31.85 | 68.77 | 4102 | 7 |
| 128.236938 | 31.05 | 40.17 | 24.10 | 62.04 | 4242 | 7 |
| 128.306839 | 25.69 | 37.99 | 20.42 | 55.98 | 4377 | 6 |
| 128.377213 | 19.24 | 33.24 | 20.79 | 48.04 | 4435 | 4 |
| 128.447815 | 19.59 | 33.28 | 21.48 | 49.62 | 4326 | 4 |
| 128.519287 | 23.76 | 37.21 | 26.56 | 58.02 | 4358 | 4 |
| 128.590927 | 22.23 | 44.53 | 18.56 | 57.50 | 4304 | 4 |
| 128.661728 | 19.06 | 42.98 | 18.28 | 54.77 | 4106 | 2 |
| 128.730972 | 17.02 | 41.07 | 29.37 | 59.13 | 4155 | 2 |
| 128.801773 | 17.35 | 45.36 | 32.18 | 64.91 | 4277 | 6 |
| 128.874680 | 20.16 | 42.12 | 27.27 | 59.99 | 4255 | 6 |
| 128.945160 | 28.64 | 50.59 | 28.66 | 73.31 | 4621 | 4 |
| 128.986618 | 33.71 | 47.64 | 26.35 | 72.44 | 975 | 4 |
| 129.023666 | 32.37 | 39.60 | 26.13 | 66.05 | 3407 | 3 |
| 129.086304 | 31.41 | 40.67 | 27.08 | 67.57 | 4040 | 3 |
| 129.157288 | 30.50 | 42.88 | 27.17 | 66.58 | 4098 | 0 |
| 129.227386 | 28.44 | 41.67 | 17.77 | 59.46 | 4225 | 0 |
| 129.297226 | 22.74 | 43.28 | 19.67 | 58.43 | 4357 | 3 |
| 129.367447 | 17.99 | 38.88 | 18.35 | 51.27 | 4421 | 3 |
| 129.438156 | 18.83 | 35.85 | 18.79 | 49.41 | 4351 | 3 |
| 129.509262 | 21.05 | 37.31 | 21.36 | 52.98 | 4321 | 4 |
| 129.581161 | 21.97 | 44.76 | 17.58 | 57.22 | 4326 | 4 |
| 129.652161 | 22.13 | 45.12 | 16.91 | 57.41 | 4139 | 4 |
| 129.721420 | 20.47 | 42.39 | 23.48 | 57.81 | 4126 | 4 |
| 129.792053 | 19.70 | 44.07 | 26.95 | 60.17 | 4275 | 6 |
| 129.863602 | 20.65 | 42.18 | 24.34 | 58.48 | 4474 | 6 |
| 129.935303 | 26.40 | 43.35 | 25.96 | 63.01 | 4599 | 7 |
| 129.985260 | 29.21 | 39.26 | 42.50 | 74.08 | 1807 | 7 |
| 130.019913 | 28.96 | 42.59 | 16.15 | 60.90 | 2604 | 5 |
| 130.075882 | 28.25 | 45.38 | 31.41 | 70.86 | 4160 | 5 |
| 130.147629 | 25.15 | 45.17 | 28.29 | 66.63 | 4079 | 9 |
| 130.217834 | 24.63 | 40.07 | 23.21 | 58.93 | 4206 | 9 |
| 130.287643 | 20.89 | 40.43 | 17.52 | 54.71 | 4344 | 4 |
| 130.357864 | 14.60 | 37.18 | 19.44 | 48.65 | 4428 | 4 |
| 130.428421 | 15.34 | 34.33 | 19.16 | 47.17 | 4366 | 6 |

| | | | | | | |
|------------|-------|-------|-------|-------|------|----|
| 130.499130 | 17.89 | 34.97 | 23.24 | 50.84 | 4238 | 6 |
| 130.571442 | 20.89 | 46.82 | 21.68 | 61.35 | 4349 | 6 |
| 130.642395 | 20.87 | 46.06 | 19.36 | 57.89 | 4164 | 12 |
| 130.711823 | 22.14 | 48.37 | 26.07 | 66.10 | 4074 | 12 |
| 130.782333 | 21.80 | 53.71 | 32.97 | 74.89 | 4262 | 12 |
| 130.853745 | 18.09 | 50.95 | 25.47 | 65.33 | 4399 | 12 |
| 130.925568 | 24.03 | 49.64 | 33.46 | 74.38 | 4603 | 9 |
| 130.981644 | 22.50 | 55.26 | 34.35 | 78.83 | 2646 | 9 |
| 131.017120 | 34.27 | 43.85 | 27.67 | 69.71 | 1805 | 12 |
| 131.065918 | 24.86 | 54.61 | 33.41 | 78.25 | 4205 | 12 |
| 131.138016 | 24.31 | 47.83 | 37.28 | 73.23 | 4057 | 9 |
| 131.208374 | 23.64 | 40.92 | 24.49 | 58.81 | 4183 | 9 |
| 131.278122 | 22.66 | 38.22 | 17.21 | 54.22 | 4340 | 4 |
| 131.348236 | 15.63 | 36.35 | 19.29 | 48.90 | 4408 | 4 |
| 131.418747 | 14.35 | 34.18 | 18.52 | 46.02 | 4383 | 3 |
| 131.489471 | 17.17 | 34.35 | 24.08 | 50.95 | 4266 | 3 |
| 131.561661 | 23.03 | 46.45 | 18.13 | 60.03 | 4372 | 5 |
| 131.632736 | 21.52 | 47.63 | 20.41 | 60.69 | 4189 | 4 |
| 131.702454 | 20.87 | 46.85 | 18.81 | 59.47 | 3993 | 4 |
| 131.772644 | 25.69 | 43.88 | 23.05 | 62.85 | 4250 | 4 |
| 131.843674 | 22.14 | 41.11 | 22.85 | 59.90 | 4299 | 4 |
| 131.915527 | 24.48 | 45.78 | 22.92 | 63.67 | 4524 | 5 |
| 131.975525 | 26.07 | 54.96 | 32.03 | 76.87 | 3160 | 5 |
| 132.012085 | 30.49 | 28.65 | 40.81 | 64.72 | 1321 | 5 |
| 132.056091 | 24.16 | 51.88 | 38.91 | 77.28 | 4223 | 5 |
| 132.128311 | 22.95 | 45.91 | 43.24 | 74.47 | 4040 | 5 |
| 132.198792 | 23.19 | 39.91 | 40.23 | 66.75 | 4156 | 5 |
| 132.268539 | 21.97 | 38.75 | 44.75 | 69.61 | 4322 | 5 |
| 132.338577 | 16.04 | 34.40 | 42.97 | 62.11 | 4388 | 5 |
| 132.409103 | 14.95 | 32.31 | 48.50 | 64.59 | 4398 | 2 |
| 132.560486 | 17.06 | 40.85 | 37.33 | 64.90 | 3399 | 5 |
| 132.623093 | 22.66 | 47.05 | 47.66 | 77.81 | 4224 | 5 |
| 132.693039 | 19.08 | 45.34 | 51.12 | 77.24 | 3921 | 2 |
| 132.763000 | 24.12 | 48.77 | 49.76 | 82.07 | 4229 | 3 |
| 132.833954 | 22.80 | 46.70 | 43.85 | 76.13 | 4283 | 3 |
| 132.905746 | 26.31 | 41.45 | 44.51 | 75.62 | 4523 | 7 |
| 132.969345 | 27.92 | 48.83 | 42.35 | 80.50 | 3579 | 7 |
| 133.005203 | 46.16 | 26.65 | 12.87 | 56.69 | 891 | 7 |
| 133.046249 | 29.81 | 48.12 | 26.91 | 71.02 | 4244 | 7 |
| 133.118652 | 30.20 | 46.18 | 32.43 | 72.19 | 4038 | 7 |
| 133.189163 | 27.10 | 47.96 | 42.95 | 77.64 | 4146 | 18 |
| 133.259048 | 30.63 | 44.42 | 33.98 | 71.49 | 4288 | 27 |
| 133.328934 | 21.56 | 37.83 | 26.51 | 58.25 | 4372 | 27 |
| 133.399521 | 16.95 | 39.37 | 30.17 | 58.58 | 4414 | 15 |
| 133.470016 | 17.26 | 38.13 | 26.71 | 54.39 | 4304 | 15 |
| 133.542053 | 20.42 | 46.84 | 25.27 | 61.95 | 4383 | 7 |
| 133.613373 | 20.51 | 49.10 | 17.96 | 60.36 | 4245 | 7 |
| 133.683746 | 16.46 | 44.16 | 17.81 | 53.36 | 4011 | 4 |
| 133.753311 | 18.35 | 41.00 | 23.90 | 55.30 | 4212 | 12 |
| 133.824310 | 17.52 | 54.96 | 28.44 | 69.45 | 4281 | 12 |
| 133.896027 | 21.79 | 48.01 | 35.10 | 71.61 | 4514 | 27 |
| 133.966232 | 27.44 | 54.65 | 30.68 | 76.80 | 4414 | 27 |
| 134.000366 | 36.28 | 69.65 | 27.19 | 83.17 | 57 | 27 |
| 134.036407 | 26.79 | 55.71 | 38.84 | 83.76 | 4261 | 27 |
| 134.179581 | 25.60 | 42.12 | 25.47 | 61.58 | 4125 | 7 |
| 134.249649 | 28.92 | 44.09 | 16.88 | 61.67 | 4244 | 7 |
| 134.319275 | 22.46 | 36.51 | 15.34 | 50.37 | 4351 | 7 |
| 134.389877 | 19.75 | 29.65 | 17.84 | 44.13 | 4427 | 9 |
| 134.460388 | 19.45 | 31.71 | 18.81 | 46.55 | 4321 | 9 |
| 134.532242 | 21.56 | 39.85 | 21.47 | 55.47 | 4372 | 18 |
| 134.603699 | 24.87 | 48.12 | 16.99 | 61.35 | 4274 | 18 |
| 134.674332 | 29.84 | 53.48 | 15.47 | 68.38 | 4077 | 22 |
| 134.743652 | 18.09 | 43.26 | 33.26 | 63.90 | 4193 | 22 |
| 134.815735 | 17.37 | 49.96 | 30.91 | 67.71 | 4081 | 15 |
| 134.886383 | 19.28 | 45.54 | 30.61 | 64.76 | 4505 | 7 |
| 134.957855 | 26.28 | 45.19 | 26.74 | 67.37 | 4617 | 7 |
| 134.996185 | 18.87 | 42.38 | 14.30 | 54.78 | 650 | 7 |
| 135.033707 | 30.20 | 43.12 | 24.85 | 66.37 | 3600 | 22 |
| 135.099167 | 30.94 | 47.01 | 32.44 | 74.02 | 4018 | 22 |
| 135.169983 | 25.18 | 43.09 | 25.66 | 62.87 | 4106 | 9 |
| 135.239914 | 25.47 | 38.05 | 20.60 | 55.93 | 4243 | 9 |

| | | | | | | |
|------------|-------|-------|--------|--------|------|----|
| 135.309814 | 19.02 | 36.78 | 18.18 | 50.23 | 4378 | 5 |
| 135.380203 | 15.88 | 32.88 | 21.42 | 47.35 | 4440 | 5 |
| 135.450806 | 17.54 | 34.16 | 22.92 | 50.27 | 4318 | 5 |
| 135.522324 | 20.03 | 39.56 | 25.19 | 56.74 | 4363 | 6 |
| 135.593964 | 21.53 | 43.12 | 19.22 | 56.20 | 4310 | 6 |
| 135.664780 | 20.31 | 45.97 | 21.01 | 58.41 | 4109 | 5 |
| 135.733994 | 17.06 | 42.82 | 28.29 | 60.85 | 4167 | 5 |
| 135.804810 | 19.69 | 48.32 | 31.83 | 67.93 | 4277 | 12 |
| 135.876480 | 24.69 | 46.98 | 42.32 | 75.80 | 4508 | 6 |
| 135.948120 | 41.86 | 48.74 | 63.04 | 99.73 | 4624 | 6 |
| 135.989166 | 40.55 | 37.07 | 100.78 | 123.65 | 925 | 6 |
| 136.026245 | 59.05 | 64.29 | 73.42 | 126.75 | 3445 | 32 |
| 136.089386 | 63.37 | 64.16 | 70.44 | 128.85 | 4023 | 32 |
| 136.160339 | 53.28 | 61.74 | 69.90 | 121.03 | 4098 | 12 |
| 136.230392 | 48.63 | 55.27 | 65.57 | 113.22 | 4227 | 12 |
| 136.300201 | 46.36 | 50.82 | 68.84 | 111.40 | 4360 | 9 |
| 136.369995 | 39.65 | 47.42 | 68.51 | 105.89 | 4368 | 9 |
| 136.443420 | 55.86 | 49.98 | 67.43 | 112.44 | 3388 | 12 |
| 136.512390 | 63.11 | 63.04 | 81.43 | 133.97 | 4333 | 7 |
| 136.584213 | 59.71 | 70.46 | 90.93 | 142.78 | 4322 | 7 |
| 136.655212 | 66.31 | 72.21 | 92.07 | 146.10 | 4134 | 9 |
| 136.724426 | 54.30 | 62.44 | 92.09 | 133.80 | 4140 | 9 |
| 136.795044 | 27.31 | 50.51 | 49.87 | 86.71 | 4282 | 6 |
| 136.866592 | 25.28 | 45.01 | 61.15 | 87.04 | 4486 | 6 |
| 136.938324 | 30.87 | 54.50 | 55.62 | 92.34 | 4615 | 9 |
| 136.986267 | 22.86 | 34.46 | 55.31 | 73.13 | 1570 | 9 |
| 137.020676 | 43.70 | 50.88 | 45.61 | 88.40 | 2782 | 12 |
| 137.078049 | 36.97 | 51.53 | 24.78 | 78.19 | 4144 | 12 |
| 137.149658 | 35.31 | 56.66 | 28.37 | 81.20 | 4085 | 32 |
| 137.219818 | 33.85 | 46.80 | 16.65 | 67.92 | 4205 | 32 |
| 137.289642 | 33.49 | 40.30 | 19.15 | 62.61 | 4339 | 15 |
| 137.359894 | 25.80 | 40.08 | 33.25 | 65.20 | 4426 | 15 |
| 137.430496 | 26.69 | 34.99 | 29.81 | 60.97 | 4363 | 15 |
| 137.501022 | 24.52 | 36.28 | 21.77 | 54.78 | 4218 | 12 |
| 137.573715 | 29.14 | 46.86 | 27.11 | 68.61 | 4325 | 12 |
| 137.644424 | 20.72 | 43.26 | 24.54 | 60.09 | 4161 | 12 |
| 137.714859 | 17.10 | 43.80 | 17.82 | 53.41 | 3826 | 12 |
| 137.784454 | 17.18 | 50.59 | 25.09 | 64.75 | 4246 | 15 |
| 137.855850 | 18.25 | 52.32 | 26.79 | 67.90 | 4405 | 15 |
| 137.927597 | 23.86 | 47.99 | 32.31 | 71.17 | 4612 | 15 |
| 137.982452 | 24.75 | 53.55 | 44.94 | 81.93 | 2467 | 15 |
| 138.017517 | 33.71 | 41.91 | 25.12 | 65.84 | 1978 | 80 |
| 138.068008 | 28.05 | 77.74 | 68.67 | 122.06 | 4202 | 80 |
| 138.140030 | 33.63 | 91.66 | 70.92 | 133.39 | 4057 | 80 |
| 138.210342 | 34.64 | 75.80 | 53.30 | 110.23 | 4189 | 80 |
| 138.280121 | 31.88 | 53.49 | 30.76 | 77.70 | 4335 | 18 |
| 138.350281 | 20.92 | 46.64 | 27.38 | 64.72 | 4398 | 18 |
| 138.420761 | 17.51 | 46.13 | 22.33 | 60.52 | 4379 | 9 |
| 138.491501 | 19.07 | 46.66 | 27.92 | 64.00 | 4262 | 9 |
| 138.563721 | 22.60 | 54.02 | 19.12 | 66.83 | 4364 | 6 |
| 138.634766 | 20.69 | 53.46 | 19.49 | 65.75 | 4184 | 4 |
| 138.704391 | 20.14 | 53.69 | 18.95 | 65.48 | 4021 | 4 |
| 138.774704 | 20.43 | 51.55 | 24.44 | 67.86 | 4252 | 12 |
| 138.845825 | 20.20 | 56.83 | 28.10 | 74.38 | 4310 | 12 |
| 138.917648 | 24.89 | 56.25 | 30.02 | 76.93 | 4539 | 15 |
| 138.976151 | 23.59 | 62.16 | 40.41 | 87.83 | 2977 | 15 |
| 139.012589 | 40.74 | 42.31 | 14.51 | 64.69 | 1502 | 18 |
| 139.058167 | 29.66 | 47.81 | 27.57 | 70.24 | 4217 | 18 |
| 139.130402 | 30.15 | 47.84 | 29.65 | 70.54 | 4043 | 9 |
| 139.200775 | 28.20 | 40.28 | 22.99 | 60.23 | 4172 | 9 |
| 139.270554 | 28.10 | 43.48 | 20.63 | 61.10 | 4325 | 6 |
| 139.340607 | 21.82 | 37.59 | 21.05 | 53.97 | 4388 | 6 |
| 139.411148 | 16.77 | 36.64 | 20.00 | 50.28 | 4392 | 6 |
| 139.481750 | 18.96 | 35.93 | 25.96 | 54.27 | 4290 | 6 |
| 139.553940 | 21.76 | 45.29 | 19.38 | 59.59 | 4376 | 4 |
| 139.625153 | 22.44 | 49.02 | 16.33 | 60.19 | 4214 | 3 |
| 139.695053 | 16.19 | 46.38 | 19.09 | 56.09 | 3912 | 3 |
| 139.765045 | 20.64 | 47.08 | 29.14 | 66.03 | 4232 | 3 |
| 139.838425 | 19.83 | 41.45 | 19.01 | 54.08 | 3691 | 3 |
| 139.907837 | 26.51 | 50.38 | 28.24 | 70.28 | 4517 | 5 |
| 139.969849 | 32.64 | 59.42 | 27.39 | 81.79 | 3399 | 5 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|-----|
| 140.006256 | 45.13 | 29.90 | 13.67 | 58.42 | 1070 | 7 |
| 140.048294 | 35.41 | 52.18 | 35.04 | 81.57 | 4239 | 7 |
| 140.120697 | 38.44 | 44.84 | 26.26 | 71.31 | 4033 | 7 |
| 140.191193 | 33.73 | 42.07 | 22.62 | 65.21 | 4148 | 7 |
| 140.261063 | 33.60 | 38.76 | 18.86 | 60.39 | 4299 | 7 |
| 140.330978 | 25.11 | 37.79 | 18.83 | 54.51 | 4363 | 7 |
| 140.401535 | 22.77 | 31.09 | 19.07 | 48.66 | 4408 | 9 |
| 140.472092 | 23.05 | 32.74 | 23.74 | 52.76 | 4305 | 9 |
| 140.538223 | 18.64 | 43.95 | 21.31 | 58.23 | 3677 | 9 |
| 140.624161 | 24.98 | 47.83 | 17.27 | 62.03 | 3305 | 9 |
| 140.685699 | 20.53 | 43.59 | 15.50 | 53.89 | 3992 | 6 |
| 140.755341 | 19.99 | 43.17 | 23.50 | 58.86 | 4214 | 5 |
| 140.826340 | 22.08 | 41.41 | 24.85 | 59.46 | 4285 | 5 |
| 140.898071 | 28.72 | 42.21 | 29.46 | 66.19 | 4515 | 5 |
| 140.967041 | 38.03 | 42.04 | 21.58 | 66.34 | 4240 | 5 |
| 141.001404 | 50.39 | 55.10 | 25.14 | 79.10 | 235 | 4 |
| 141.038437 | 38.01 | 47.83 | 31.87 | 76.91 | 4256 | 4 |
| 141.110992 | 44.87 | 45.94 | 33.18 | 79.61 | 4030 | 4 |
| 141.181625 | 41.49 | 46.42 | 42.71 | 83.79 | 4126 | 3 |
| 141.251511 | 42.20 | 42.49 | 32.03 | 75.41 | 4270 | 4 |
| 141.321350 | 35.30 | 38.22 | 31.35 | 66.99 | 4357 | 4 |
| 141.391907 | 29.12 | 32.97 | 24.40 | 56.00 | 4426 | 3 |
| 141.462402 | 21.47 | 32.83 | 25.13 | 53.11 | 4323 | 3 |
| 141.534302 | 24.23 | 43.14 | 23.52 | 60.52 | 4371 | 4 |
| 141.605713 | 23.16 | 47.10 | 18.72 | 59.89 | 4278 | 4 |
| 141.676331 | 18.95 | 43.44 | 20.31 | 55.47 | 4068 | 4 |
| 141.745697 | 15.51 | 42.38 | 28.00 | 58.32 | 4205 | 4 |
| 141.816605 | 17.96 | 52.13 | 25.86 | 66.92 | 4277 | 9 |
| 141.888412 | 22.03 | 50.81 | 30.25 | 68.79 | 4518 | 5 |
| 141.959900 | 28.88 | 45.97 | 27.55 | 66.79 | 4609 | 5 |
| 141.997208 | 18.51 | 34.77 | 13.67 | 45.87 | 473 | 5 |
| 142.034012 | 32.20 | 53.71 | 34.32 | 80.81 | 3724 | 6 |
| 142.101257 | 34.43 | 43.46 | 31.81 | 72.74 | 4020 | 6 |
| 142.171951 | 27.12 | 45.73 | 27.05 | 66.20 | 4107 | 7 |
| 142.241989 | 28.00 | 38.51 | 26.67 | 59.63 | 4245 | 7 |
| 142.311859 | 24.10 | 36.82 | 15.56 | 51.90 | 4379 | 6 |
| 142.382217 | 18.90 | 30.35 | 14.11 | 42.60 | 4437 | 4 |
| 142.452850 | 15.61 | 31.83 | 13.45 | 41.66 | 4312 | 4 |
| 142.524414 | 22.09 | 37.40 | 21.16 | 53.66 | 4360 | 4 |
| 142.596024 | 21.79 | 44.79 | 16.69 | 56.36 | 4308 | 4 |
| 142.666824 | 18.15 | 42.96 | 15.53 | 52.96 | 4101 | 5 |
| 142.736069 | 18.57 | 48.15 | 25.59 | 62.19 | 4176 | 5 |
| 142.806870 | 17.19 | 49.83 | 29.29 | 66.06 | 4278 | 4 |
| 142.878708 | 21.52 | 50.29 | 35.97 | 72.70 | 4492 | 7 |
| 142.950226 | 25.21 | 52.84 | 32.27 | 73.78 | 4634 | 7 |
| 142.991287 | 21.75 | 44.39 | 54.97 | 83.75 | 930 | 7 |
| 143.028336 | 32.20 | 42.66 | 32.39 | 69.91 | 3424 | 5 |
| 143.091522 | 28.98 | 44.83 | 41.98 | 76.92 | 4018 | 5 |
| 143.162399 | 24.94 | 44.37 | 40.27 | 71.65 | 4104 | 9 |
| 143.232422 | 24.82 | 36.95 | 52.23 | 74.63 | 4231 | 9 |
| 143.302231 | 20.57 | 34.80 | 75.57 | 92.75 | 4362 | 7 |
| 143.372528 | 14.91 | 33.23 | 77.34 | 90.41 | 4426 | 7 |
| 143.443207 | 18.81 | 31.99 | 79.86 | 92.12 | 4344 | 12 |
| 143.514511 | 22.25 | 38.02 | 75.33 | 93.99 | 4349 | 7 |
| 143.586258 | 28.24 | 49.00 | 91.90 | 116.37 | 4319 | 7 |
| 143.657242 | 22.36 | 44.62 | 82.48 | 105.03 | 4131 | 5 |
| 143.803360 | 29.07 | 64.75 | 74.98 | 116.50 | 3542 | 9 |
| 143.868683 | 24.31 | 47.76 | 61.06 | 88.86 | 4494 | 9 |
| 143.940384 | 28.31 | 46.99 | 73.18 | 98.77 | 4620 | 7 |
| 143.986710 | 21.90 | 43.15 | 62.29 | 84.75 | 1391 | 7 |
| 144.021881 | 36.92 | 49.02 | 49.73 | 87.30 | 3011 | 6 |
| 144.081223 | 33.99 | 48.78 | 42.95 | 82.46 | 4114 | 6 |
| 144.152756 | 30.03 | 48.45 | 46.09 | 81.39 | 4091 | 9 |
| 144.222870 | 26.83 | 44.26 | 46.56 | 76.23 | 4210 | 9 |
| 144.292633 | 25.88 | 39.81 | 57.43 | 81.94 | 4340 | 9 |
| 144.362900 | 19.47 | 34.46 | 61.88 | 79.97 | 4420 | 9 |
| 144.433533 | 20.96 | 34.81 | 55.85 | 74.43 | 4366 | 6 |
| 144.504333 | 24.16 | 38.10 | 52.40 | 75.39 | 4252 | 7 |
| 144.576553 | 27.37 | 45.87 | 56.16 | 83.09 | 4351 | 7 |
| 144.647507 | 25.42 | 44.79 | 47.09 | 75.33 | 4156 | 18 |
| 144.793777 | 28.23 | 65.39 | 80.16 | 114.69 | 3528 | 111 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|-----|
| 144.858948 | 24.72 | 50.49 | 50.62 | 83.43 | 4410 | 111 |
| 144.930573 | 31.70 | 54.14 | 69.33 | 104.57 | 4623 | 67 |
| 144.983734 | 30.27 | 73.79 | 78.85 | 127.64 | 2225 | 67 |
| 145.018066 | 49.15 | 82.51 | 89.83 | 143.66 | 2157 | 207 |
| 145.070145 | 32.07 | 73.42 | 55.31 | 108.66 | 4186 | 207 |
| 145.142075 | 36.20 | 140.72 | 122.29 | 210.18 | 4051 | 179 |
| 145.212402 | 37.55 | 106.24 | 56.18 | 132.93 | 4183 | 179 |
| 145.282135 | 33.36 | 92.48 | 63.93 | 126.58 | 4336 | 80 |
| 145.352310 | 29.23 | 105.21 | 60.66 | 138.80 | 4411 | 80 |
| 145.422836 | 22.58 | 90.16 | 51.60 | 116.00 | 4378 | 67 |
| 145.493515 | 21.35 | 86.01 | 87.85 | 138.26 | 4260 | 67 |
| 145.565781 | 27.37 | 71.90 | 54.63 | 110.25 | 4360 | 48 |
| 145.636826 | 27.94 | 65.39 | 25.68 | 83.23 | 4179 | 48 |
| 145.706375 | 27.29 | 74.63 | 20.49 | 91.93 | 4034 | 48 |
| 145.776733 | 33.69 | 83.87 | 32.22 | 106.39 | 4249 | 80 |
| 145.848007 | 28.42 | 70.75 | 24.62 | 89.03 | 4339 | 80 |
| 145.919739 | 31.71 | 67.80 | 29.23 | 89.05 | 4547 | 32 |
| 145.978256 | 30.06 | 70.27 | 19.22 | 85.65 | 2975 | 32 |
| 146.014694 | 55.77 | 58.89 | 51.75 | 103.33 | 1496 | 39 |
| 146.060272 | 32.72 | 79.18 | 33.54 | 99.79 | 4212 | 39 |
| 146.124817 | 26.37 | 64.92 | 28.11 | 85.03 | 3189 | 39 |
| 146.202820 | 28.72 | 55.11 | 25.05 | 77.81 | 4172 | 39 |
| 146.272614 | 31.12 | 59.01 | 26.50 | 81.64 | 4328 | 27 |
| 146.342667 | 24.59 | 58.95 | 34.83 | 82.26 | 4394 | 27 |
| 146.413223 | 20.06 | 56.27 | 22.70 | 71.70 | 4394 | 27 |
| 146.483841 | 21.31 | 50.99 | 23.29 | 66.58 | 4294 | 27 |
| 146.556046 | 28.88 | 57.88 | 24.53 | 76.42 | 4374 | 15 |
| 146.627167 | 26.97 | 55.23 | 26.36 | 74.53 | 4204 | 22 |
| 146.697159 | 24.05 | 54.09 | 29.31 | 75.33 | 3915 | 22 |
| 146.767136 | 29.46 | 60.49 | 31.53 | 82.52 | 4232 | 27 |
| 146.838135 | 28.07 | 56.60 | 22.96 | 74.79 | 4295 | 27 |
| 146.909897 | 31.25 | 55.63 | 29.37 | 80.46 | 4519 | 27 |
| 146.970825 | 39.53 | 68.96 | 50.56 | 108.38 | 3278 | 27 |
| 147.007538 | 39.09 | 39.74 | 7.37 | 58.90 | 1208 | 15 |
| 147.050415 | 31.29 | 65.35 | 28.87 | 87.35 | 4241 | 15 |
| 147.122757 | 28.82 | 55.76 | 27.68 | 76.82 | 4047 | 15 |
| 147.193268 | 27.26 | 48.31 | 27.35 | 69.77 | 4152 | 18 |
| 147.260468 | 27.36 | 43.21 | 21.00 | 61.87 | 3951 | 18 |
| 147.333038 | 27.77 | 43.72 | 22.73 | 63.35 | 4375 | 18 |
| 147.403580 | 26.37 | 45.91 | 29.90 | 66.84 | 4404 | 18 |
| 147.474152 | 24.41 | 41.33 | 23.29 | 60.29 | 4302 | 18 |
| 147.546188 | 27.01 | 48.55 | 29.28 | 69.46 | 4374 | 9 |
| 147.617493 | 27.00 | 51.06 | 26.15 | 70.45 | 4243 | 9 |
| 147.687576 | 27.78 | 47.58 | 18.84 | 64.74 | 3955 | 22 |
| 147.757416 | 26.61 | 45.98 | 19.76 | 64.14 | 4223 | 18 |
| 147.828339 | 27.08 | 44.45 | 14.02 | 59.76 | 4288 | 18 |
| 147.900116 | 31.31 | 43.44 | 20.10 | 65.20 | 4517 | 2 |
| 147.967651 | 35.56 | 43.42 | 29.17 | 70.20 | 4057 | 2 |
| 148.002426 | 64.51 | 46.70 | 26.53 | 85.98 | 413 | 7 |
| 148.040527 | 40.93 | 47.83 | 21.01 | 73.34 | 4260 | 7 |
| 148.113037 | 41.99 | 47.42 | 17.24 | 72.13 | 4025 | 7 |
| 148.183640 | 33.79 | 44.38 | 19.85 | 64.61 | 4131 | 6 |
| 148.253540 | 36.44 | 39.50 | 19.64 | 61.95 | 4270 | 5 |
| 148.323364 | 28.18 | 39.83 | 16.26 | 57.32 | 4359 | 5 |
| 148.393936 | 24.05 | 36.78 | 22.87 | 54.81 | 4426 | 6 |
| 148.464447 | 24.75 | 38.55 | 20.81 | 56.63 | 4326 | 6 |
| 148.536392 | 26.60 | 42.94 | 26.85 | 63.05 | 4373 | 9 |
| 148.607742 | 27.56 | 46.97 | 18.97 | 63.91 | 4263 | 9 |
| 148.678375 | 27.94 | 43.27 | 19.81 | 60.28 | 4057 | 12 |
| 148.747726 | 26.59 | 41.95 | 26.76 | 64.11 | 4209 | 12 |
| 148.818665 | 27.65 | 45.60 | 14.12 | 59.66 | 4278 | 9 |
| 148.890411 | 32.26 | 48.38 | 33.45 | 76.25 | 4514 | 12 |
| 148.962006 | 40.11 | 47.26 | 26.26 | 73.60 | 4606 | 12 |
| 148.998245 | 24.19 | 63.70 | 24.85 | 73.47 | 296 | 12 |
| 149.034348 | 38.86 | 45.02 | 19.37 | 69.84 | 3870 | 5 |
| 149.103333 | 39.72 | 48.74 | 21.22 | 74.47 | 4016 | 5 |
| 149.174072 | 30.27 | 46.06 | 19.31 | 65.17 | 4111 | 6 |
| 149.243988 | 34.59 | 42.05 | 20.45 | 64.05 | 4253 | 6 |
| 149.313858 | 27.61 | 39.69 | 15.80 | 56.97 | 4378 | 7 |
| 149.384262 | 23.15 | 34.27 | 19.24 | 52.33 | 4433 | 9 |
| 149.454819 | 22.75 | 36.44 | 21.65 | 54.10 | 4337 | 9 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 149.526535 | 26.79 | 40.74 | 28.38 | 64.15 | 4369 | 9 |
| 149.598053 | 25.77 | 45.64 | 29.01 | 66.43 | 4300 | 9 |
| 149.668823 | 25.01 | 45.20 | 20.91 | 62.40 | 4091 | 12 |
| 149.738129 | 24.32 | 47.47 | 28.92 | 66.14 | 4178 | 12 |
| 149.808914 | 26.30 | 50.30 | 13.49 | 63.62 | 4274 | 12 |
| 149.880783 | 28.97 | 51.25 | 31.71 | 76.79 | 4491 | 12 |
| 149.952286 | 37.61 | 52.48 | 37.42 | 82.93 | 4637 | 12 |
| 149.990845 | 29.22 | 39.10 | 27.18 | 62.18 | 693 | 12 |
| 150.028976 | 37.43 | 50.37 | 27.70 | 77.11 | 3581 | 7 |
| 150.093582 | 36.61 | 48.73 | 24.74 | 72.88 | 4015 | 7 |
| 150.164444 | 30.04 | 48.57 | 22.84 | 68.62 | 4103 | 15 |
| 150.234451 | 31.73 | 42.60 | 27.62 | 67.25 | 4230 | 15 |
| 150.304276 | 27.94 | 37.64 | 20.81 | 57.90 | 4365 | 9 |
| 150.374634 | 22.22 | 36.36 | 21.45 | 53.24 | 4430 | 9 |
| 150.445251 | 20.28 | 36.91 | 13.46 | 48.94 | 4342 | 9 |
| 150.516647 | 25.19 | 39.41 | 14.96 | 54.60 | 4352 | 22 |
| 150.588348 | 26.09 | 46.19 | 15.62 | 61.27 | 4320 | 22 |
| 150.659195 | 24.15 | 41.88 | 21.00 | 57.80 | 4122 | 39 |
| 150.728500 | 24.31 | 58.64 | 23.54 | 74.14 | 4152 | 39 |
| 150.799179 | 25.18 | 45.30 | 23.95 | 67.02 | 4285 | 48 |
| 150.870911 | 30.21 | 61.05 | 30.88 | 84.75 | 4477 | 48 |
| 150.942459 | 34.31 | 58.52 | 33.52 | 86.29 | 4622 | 39 |
| 150.986984 | 39.56 | 70.68 | 26.55 | 93.15 | 1208 | 39 |
| 151.022675 | 33.54 | 59.72 | 61.84 | 103.99 | 3182 | 32 |
| 151.083374 | 35.59 | 61.29 | 52.15 | 102.35 | 4104 | 32 |
| 151.154800 | 30.68 | 51.20 | 51.07 | 87.29 | 4098 | 12 |
| 151.224899 | 31.93 | 46.94 | 53.65 | 86.50 | 4213 | 12 |
| 151.294739 | 33.21 | 53.77 | 51.92 | 90.75 | 4337 | 32 |
| 151.364944 | 23.67 | 38.25 | 50.22 | 75.25 | 4426 | 32 |
| 151.435593 | 20.73 | 37.82 | 56.82 | 79.95 | 4357 | 18 |
| 151.506470 | 23.70 | 41.38 | 52.05 | 79.98 | 4275 | 22 |
| 151.578644 | 19.20 | 47.75 | 46.23 | 79.66 | 4350 | 22 |
| 151.649567 | 18.32 | 51.29 | 47.80 | 80.92 | 4147 | 22 |
| 151.796051 | 24.97 | 50.38 | 45.79 | 82.17 | 3507 | 15 |
| 151.861038 | 22.13 | 56.21 | 48.12 | 87.00 | 4423 | 15 |
| 151.932709 | 28.03 | 56.34 | 47.42 | 92.57 | 4611 | 22 |
| 151.984497 | 28.86 | 62.83 | 51.72 | 95.32 | 2049 | 22 |
| 152.018723 | 28.27 | 41.92 | 24.39 | 64.68 | 2327 | 12 |
| 152.072250 | 27.44 | 50.80 | 32.15 | 74.13 | 4186 | 12 |
| 152.144150 | 24.46 | 50.34 | 39.03 | 76.54 | 4062 | 27 |
| 152.214417 | 24.44 | 40.89 | 29.06 | 62.31 | 4184 | 27 |
| 152.284149 | 22.92 | 39.02 | 20.60 | 54.73 | 4330 | 9 |
| 152.354401 | 15.56 | 35.94 | 19.72 | 48.95 | 4423 | 9 |
| 152.424927 | 14.03 | 33.60 | 18.39 | 46.23 | 4373 | 4 |
| 152.495560 | 16.19 | 37.07 | 24.53 | 52.30 | 4264 | 4 |
| 152.567841 | 22.67 | 45.62 | 21.74 | 60.34 | 4354 | 4 |
| 152.638870 | 19.46 | 45.28 | 19.91 | 56.60 | 4178 | 4 |
| 152.708389 | 18.07 | 48.19 | 20.61 | 59.71 | 4057 | 4 |
| 152.778824 | 19.67 | 45.18 | 26.65 | 61.21 | 4255 | 6 |
| 152.850189 | 20.76 | 43.12 | 25.06 | 59.61 | 4365 | 6 |
| 152.921738 | 25.77 | 43.65 | 24.56 | 63.75 | 4548 | 12 |
| 152.980133 | 25.42 | 58.53 | 32.37 | 80.87 | 2947 | 12 |
| 153.016510 | 42.00 | 33.36 | 19.06 | 62.36 | 1517 | 15 |
| 153.062378 | 29.06 | 50.10 | 28.57 | 73.22 | 4209 | 15 |
| 153.134476 | 28.51 | 46.50 | 30.96 | 70.16 | 4049 | 15 |
| 153.204880 | 24.91 | 46.29 | 32.72 | 69.16 | 4178 | 15 |
| 153.274612 | 25.27 | 40.32 | 23.47 | 59.54 | 4322 | 12 |
| 153.344727 | 18.32 | 33.60 | 22.08 | 49.34 | 4398 | 12 |
| 153.415268 | 14.19 | 33.23 | 17.45 | 44.83 | 4392 | 3 |
| 153.485886 | 16.35 | 36.58 | 22.00 | 50.88 | 4285 | 3 |
| 153.558151 | 20.99 | 44.72 | 24.52 | 60.20 | 4369 | 6 |
| 153.629211 | 21.18 | 47.41 | 20.96 | 60.34 | 4208 | 4 |
| 153.699158 | 16.62 | 45.88 | 17.69 | 55.00 | 3937 | 4 |
| 153.769180 | 20.04 | 43.84 | 26.65 | 60.99 | 4228 | 3 |
| 153.840195 | 20.87 | 43.61 | 21.29 | 58.05 | 4297 | 3 |
| 153.911972 | 27.22 | 42.83 | 25.95 | 63.59 | 4527 | 9 |
| 153.972778 | 32.86 | 47.84 | 29.20 | 72.08 | 3263 | 9 |
| 154.009521 | 37.90 | 27.25 | 45.00 | 70.53 | 1218 | 6 |
| 154.052505 | 32.78 | 54.93 | 40.08 | 85.32 | 4236 | 6 |
| 154.124786 | 34.33 | 48.06 | 39.41 | 80.46 | 4044 | 6 |
| 154.195297 | 28.89 | 41.77 | 43.53 | 73.52 | 4152 | 7 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 154.265091 | 29.49 | 34.78 | 42.87 | 69.48 | 4313 | 9 |
| 154.335083 | 21.16 | 32.47 | 50.13 | 68.92 | 4374 | 9 |
| 154.405655 | 17.57 | 32.68 | 49.98 | 68.47 | 4406 | 4 |
| 154.556931 | 21.82 | 44.22 | 40.44 | 70.94 | 3402 | 4 |
| 154.619583 | 22.57 | 46.40 | 48.14 | 78.58 | 4238 | 4 |
| 154.690460 | 17.04 | 39.07 | 52.86 | 74.48 | 3636 | 4 |
| 154.759521 | 19.51 | 42.12 | 49.48 | 76.04 | 4221 | 7 |
| 154.830490 | 20.89 | 41.24 | 45.36 | 73.88 | 4289 | 7 |
| 154.902222 | 26.37 | 40.41 | 47.45 | 78.39 | 4517 | 7 |
| 154.968399 | 31.90 | 46.44 | 44.92 | 82.28 | 3881 | 7 |
| 155.003479 | 50.66 | 28.81 | 36.99 | 72.02 | 592 | 12 |
| 155.042633 | 32.88 | 51.71 | 41.85 | 83.68 | 4256 | 12 |
| 155.115204 | 35.76 | 49.65 | 48.12 | 88.78 | 4026 | 12 |
| 155.191574 | 29.00 | 46.39 | 40.02 | 73.76 | 3483 | 7 |
| 155.255569 | 27.73 | 35.83 | 46.84 | 71.62 | 4281 | 9 |
| 155.325455 | 21.27 | 33.64 | 42.53 | 64.29 | 4362 | 9 |
| 155.395996 | 17.96 | 30.54 | 53.29 | 69.37 | 4428 | 18 |
| 155.466553 | 18.42 | 40.43 | 49.47 | 74.07 | 4312 | 18 |
| 155.538528 | 22.70 | 47.03 | 45.02 | 79.32 | 4383 | 15 |
| 155.688965 | 18.10 | 44.61 | 48.06 | 74.72 | 3162 | 6 |
| 155.749832 | 20.26 | 45.16 | 52.25 | 81.44 | 4203 | 6 |
| 155.820770 | 21.56 | 48.00 | 47.31 | 81.06 | 4281 | 15 |
| 155.892517 | 26.63 | 45.06 | 47.66 | 81.82 | 4513 | 7 |
| 155.964096 | 35.57 | 44.32 | 45.18 | 82.81 | 4607 | 7 |
| 155.999313 | 18.82 | 59.09 | 18.28 | 65.41 | 119 | 7 |
| 156.034836 | 36.49 | 45.09 | 23.95 | 70.92 | 4026 | 4 |
| 156.105408 | 35.46 | 47.07 | 27.41 | 72.43 | 4024 | 4 |
| 156.176117 | 26.49 | 42.91 | 24.41 | 62.53 | 4116 | 6 |
| 156.246048 | 28.59 | 36.19 | 21.37 | 55.42 | 4256 | 6 |
| 156.315933 | 23.40 | 32.89 | 17.43 | 49.86 | 4378 | 12 |
| 156.386337 | 17.39 | 32.16 | 16.98 | 43.98 | 4427 | 2 |
| 156.456924 | 15.63 | 33.16 | 17.41 | 44.39 | 4331 | 2 |
| 156.528687 | 20.66 | 40.77 | 19.02 | 54.10 | 4365 | 3 |
| 156.600159 | 20.05 | 44.71 | 18.01 | 56.04 | 4295 | 3 |
| 156.670868 | 18.00 | 42.19 | 14.94 | 51.55 | 4085 | 15 |
| 156.740204 | 20.57 | 56.31 | 35.38 | 75.83 | 4179 | 15 |
| 156.811035 | 23.05 | 45.08 | 23.94 | 63.01 | 4274 | 32 |
| 156.882904 | 25.21 | 44.78 | 34.11 | 68.84 | 4497 | 22 |
| 156.954361 | 31.70 | 53.40 | 37.03 | 81.96 | 4629 | 22 |
| 156.992920 | 21.59 | 46.00 | 22.42 | 58.34 | 689 | 22 |
| 157.030563 | 32.17 | 61.42 | 45.76 | 97.32 | 3635 | 27 |
| 157.095688 | 28.97 | 50.00 | 39.14 | 78.79 | 4018 | 27 |
| 157.166534 | 22.15 | 48.38 | 33.88 | 69.21 | 4104 | 15 |
| 157.236511 | 25.02 | 44.90 | 33.71 | 67.30 | 4239 | 15 |
| 157.306412 | 17.03 | 39.22 | 27.09 | 55.43 | 4376 | 27 |
| 157.376709 | 14.58 | 29.22 | 29.57 | 49.42 | 4425 | 18 |
| 157.447357 | 16.31 | 37.12 | 27.86 | 55.62 | 4321 | 18 |
| 157.518753 | 24.24 | 43.64 | 49.78 | 81.50 | 4345 | 39 |
| 157.590424 | 20.99 | 45.94 | 24.76 | 60.53 | 4315 | 39 |
| 157.661285 | 19.80 | 45.25 | 18.39 | 55.65 | 4113 | 15 |
| 157.730560 | 19.66 | 49.09 | 26.74 | 63.82 | 4163 | 15 |
| 157.801285 | 20.96 | 52.18 | 31.88 | 71.51 | 4284 | 27 |
| 157.873001 | 23.33 | 44.27 | 35.88 | 67.67 | 4481 | 27 |
| 157.944565 | 27.84 | 47.39 | 23.16 | 67.48 | 4618 | 27 |
| 157.987076 | 33.71 | 92.68 | 34.99 | 108.91 | 1035 | 27 |
| 158.023529 | 29.41 | 41.04 | 25.52 | 64.46 | 3354 | 15 |
| 158.085617 | 28.07 | 45.67 | 25.99 | 67.45 | 4080 | 15 |
| 158.162491 | 23.92 | 40.70 | 26.86 | 60.71 | 3501 | 9 |
| 158.226959 | 23.23 | 37.20 | 21.86 | 54.19 | 4216 | 9 |
| 158.296753 | 19.87 | 38.49 | 14.48 | 50.66 | 4346 | 9 |
| 158.367065 | 13.08 | 37.53 | 24.92 | 50.84 | 4433 | 9 |
| 158.437668 | 14.66 | 33.71 | 23.25 | 48.89 | 4352 | 12 |
| 158.508682 | 17.34 | 38.38 | 28.18 | 56.50 | 4301 | 18 |
| 158.580688 | 22.73 | 47.95 | 18.38 | 59.70 | 4335 | 18 |
| 158.651672 | 19.64 | 48.40 | 20.74 | 60.23 | 4136 | 48 |
| 158.721024 | 18.35 | 49.18 | 21.83 | 62.00 | 4124 | 48 |
| 158.791580 | 22.27 | 55.24 | 28.33 | 72.43 | 4267 | 6 |
| 158.863129 | 20.01 | 42.31 | 29.31 | 63.42 | 4453 | 6 |
| 158.934799 | 23.64 | 43.68 | 30.71 | 68.79 | 4621 | 5 |
| 158.985245 | 28.65 | 48.56 | 49.14 | 83.16 | 1871 | 5 |
| 159.019424 | 26.45 | 44.90 | 18.40 | 61.96 | 2496 | 6 |

| | | | | | | |
|------------|-------|-------|--------|--------|------|----|
| 159.074432 | 27.42 | 43.42 | 28.58 | 66.49 | 4170 | 6 |
| 159.146240 | 25.54 | 42.64 | 23.92 | 62.42 | 4069 | 5 |
| 159.216431 | 30.01 | 36.92 | 18.47 | 57.64 | 4197 | 5 |
| 159.286209 | 29.48 | 37.51 | 14.38 | 53.99 | 4333 | 9 |
| 159.356461 | 21.70 | 33.87 | 19.55 | 49.25 | 4420 | 9 |
| 159.427032 | 18.97 | 32.64 | 20.50 | 46.53 | 4376 | 12 |
| 159.497635 | 22.08 | 33.72 | 22.54 | 51.57 | 4260 | 12 |
| 159.569977 | 23.12 | 44.72 | 17.50 | 57.47 | 4355 | 12 |
| 159.640961 | 22.30 | 45.88 | 16.99 | 58.12 | 4175 | 12 |
| 159.710434 | 18.85 | 42.83 | 20.21 | 55.71 | 4073 | 12 |
| 159.780914 | 15.28 | 47.36 | 27.87 | 62.52 | 4254 | 12 |
| 159.852356 | 19.41 | 52.23 | 25.41 | 68.11 | 4373 | 12 |
| 159.923813 | 28.32 | 55.34 | 31.77 | 79.38 | 4561 | 22 |
| 159.981049 | 27.72 | 61.66 | 33.51 | 82.68 | 2769 | 22 |
| 160.016785 | 45.60 | 42.93 | 36.15 | 79.98 | 1692 | 12 |
| 160.064438 | 31.96 | 43.61 | 46.36 | 80.49 | 4199 | 12 |
| 160.136810 | 29.81 | 46.94 | 45.93 | 81.51 | 3975 | 22 |
| 160.206940 | 28.48 | 42.44 | 47.11 | 78.52 | 4182 | 22 |
| 160.276672 | 29.88 | 45.41 | 45.45 | 81.08 | 4311 | 32 |
| 160.346817 | 18.85 | 31.48 | 52.27 | 70.86 | 4399 | 32 |
| 160.417328 | 18.63 | 42.20 | 58.51 | 80.33 | 4386 | 94 |
| 160.487991 | 20.25 | 36.89 | 56.23 | 77.65 | 4280 | 94 |
| 160.640167 | 28.46 | 57.47 | 62.97 | 100.52 | 3269 | 94 |
| 160.701172 | 26.73 | 76.97 | 56.39 | 112.26 | 3956 | 94 |
| 160.771255 | 26.80 | 97.59 | 64.99 | 134.37 | 4239 | 80 |
| 160.842331 | 31.12 | 85.04 | 52.07 | 117.25 | 4295 | 80 |
| 160.914062 | 37.43 | 73.35 | 48.27 | 109.23 | 4531 | 48 |
| 160.975006 | 42.99 | 57.30 | 52.99 | 104.53 | 3280 | 48 |
| 161.011597 | 35.78 | 42.87 | 15.49 | 60.43 | 1224 | 3 |
| 161.054642 | 40.21 | 54.20 | 31.04 | 82.37 | 4229 | 3 |
| 161.126907 | 43.56 | 52.88 | 24.04 | 78.80 | 4050 | 5 |
| 161.197342 | 36.37 | 44.57 | 26.10 | 68.20 | 4160 | 5 |
| 161.267166 | 37.19 | 42.54 | 20.08 | 64.16 | 4316 | 5 |
| 161.337173 | 27.05 | 38.35 | 21.78 | 57.42 | 4372 | 5 |
| 161.407700 | 22.47 | 35.88 | 20.75 | 51.51 | 4404 | 9 |
| 161.478363 | 22.08 | 38.19 | 23.09 | 55.60 | 4301 | 9 |
| 161.550446 | 23.76 | 47.31 | 18.16 | 61.71 | 4369 | 5 |
| 161.621719 | 22.48 | 49.51 | 16.41 | 62.12 | 4241 | 5 |
| 161.691620 | 21.46 | 47.41 | 16.28 | 58.90 | 3926 | 4 |
| 161.761597 | 21.34 | 52.41 | 36.72 | 76.94 | 4220 | 2 |
| 161.832581 | 26.59 | 49.03 | 30.24 | 71.39 | 4292 | 2 |
| 161.904327 | 32.01 | 46.57 | 32.41 | 75.12 | 4516 | 9 |
| 161.968964 | 34.19 | 44.62 | 28.02 | 70.39 | 3703 | 9 |
| 162.004517 | 49.75 | 34.59 | 19.64 | 66.75 | 772 | 22 |
| 162.044769 | 37.76 | 59.07 | 34.37 | 88.51 | 4254 | 22 |
| 162.117264 | 42.56 | 49.64 | 41.01 | 85.30 | 4037 | 22 |
| 162.187775 | 34.32 | 42.20 | 30.92 | 70.11 | 4144 | 22 |
| 162.257599 | 36.37 | 47.97 | 35.98 | 76.71 | 4294 | 22 |
| 162.327530 | 27.06 | 52.51 | 32.47 | 77.46 | 4361 | 22 |
| 162.398056 | 24.02 | 51.41 | 36.61 | 76.37 | 4425 | 32 |
| 162.468613 | 21.06 | 43.02 | 28.71 | 63.22 | 4300 | 32 |
| 162.540665 | 26.80 | 55.79 | 36.65 | 79.69 | 4390 | 27 |
| 162.611984 | 21.70 | 55.65 | 25.55 | 72.48 | 4253 | 27 |
| 162.682434 | 25.44 | 54.10 | 18.04 | 70.45 | 4025 | 18 |
| 162.751938 | 17.77 | 61.84 | 27.77 | 81.36 | 4208 | 15 |
| 162.822861 | 23.58 | 57.76 | 25.08 | 74.41 | 4284 | 15 |
| 162.894608 | 28.19 | 51.67 | 30.46 | 73.85 | 4516 | 12 |
| 162.965759 | 35.59 | 52.72 | 31.65 | 79.90 | 4550 | 12 |
| 163.035446 | 35.32 | 61.31 | 92.78 | 130.07 | 4198 | 7 |
| 163.107529 | 41.43 | 54.28 | 97.54 | 131.86 | 4024 | 7 |
| 163.178192 | 36.15 | 52.27 | 94.97 | 125.16 | 4121 | 15 |
| 163.248123 | 35.67 | 41.88 | 96.38 | 118.79 | 4258 | 15 |
| 163.317993 | 28.77 | 43.08 | 93.65 | 114.67 | 4375 | 12 |
| 163.388397 | 21.87 | 37.04 | 106.52 | 121.64 | 4414 | 39 |
| 163.459015 | 20.33 | 46.83 | 97.26 | 121.07 | 4322 | 39 |
| 163.530807 | 22.17 | 45.09 | 103.63 | 127.63 | 4374 | 32 |
| 163.602280 | 22.09 | 53.15 | 97.90 | 127.12 | 4289 | 32 |
| 163.813080 | 23.68 | 56.78 | 93.13 | 125.67 | 4273 | 39 |
| 163.884979 | 26.77 | 44.33 | 100.80 | 124.10 | 4506 | 6 |
| 163.956406 | 37.46 | 43.78 | 95.16 | 122.83 | 4618 | 6 |
| 163.994980 | 23.36 | 40.89 | 127.93 | 141.39 | 684 | 6 |

| | | | | | | |
|------------|-------|-------|-------|-------|------|----|
| 164.032623 | 45.16 | 46.95 | 28.78 | 78.96 | 3589 | 12 |
| 164.097794 | 44.56 | 49.52 | 28.18 | 79.91 | 4019 | 12 |
| 164.168579 | 35.29 | 46.08 | 27.06 | 70.47 | 4101 | 12 |
| 164.238586 | 35.64 | 41.48 | 23.27 | 64.25 | 4242 | 12 |
| 164.308456 | 31.48 | 39.93 | 20.18 | 60.62 | 4380 | 18 |
| 164.378799 | 25.26 | 34.93 | 20.31 | 52.67 | 4427 | 5 |
| 164.449432 | 22.19 | 34.72 | 19.16 | 51.16 | 4328 | 5 |
| 164.520874 | 23.96 | 43.81 | 22.16 | 60.11 | 4360 | 22 |
| 164.592606 | 23.62 | 56.78 | 32.27 | 75.46 | 4311 | 22 |
| 164.663406 | 22.45 | 51.18 | 22.37 | 66.16 | 4116 | 22 |
| 164.732635 | 18.64 | 52.33 | 31.71 | 72.88 | 4168 | 22 |
| 164.803421 | 19.02 | 45.08 | 33.97 | 69.33 | 4277 | 15 |
| 164.875076 | 26.00 | 49.80 | 32.02 | 71.11 | 4494 | 15 |
| 164.946671 | 28.89 | 39.26 | 32.92 | 68.03 | 4617 | 15 |
| 164.987778 | 36.93 | 68.47 | 30.34 | 87.19 | 926 | 15 |
| 165.024841 | 36.68 | 39.66 | 29.13 | 70.26 | 3454 | 6 |
| 165.087875 | 33.80 | 45.29 | 32.63 | 74.97 | 4053 | 6 |
| 165.158997 | 28.52 | 46.97 | 28.74 | 68.94 | 4103 | 9 |
| 165.229004 | 30.14 | 42.17 | 23.71 | 61.68 | 4219 | 9 |
| 165.298859 | 26.55 | 38.45 | 15.92 | 54.59 | 4353 | 9 |
| 165.369125 | 19.04 | 34.79 | 20.68 | 49.78 | 4419 | 9 |
| 165.439758 | 16.06 | 35.81 | 19.96 | 49.70 | 4338 | 12 |
| 165.510910 | 19.10 | 45.42 | 28.22 | 63.61 | 4338 | 18 |
| 165.582794 | 20.79 | 50.34 | 29.64 | 67.64 | 4329 | 18 |
| 165.653778 | 17.87 | 46.06 | 14.83 | 55.40 | 4136 | 7 |
| 165.723068 | 17.76 | 42.41 | 21.43 | 55.46 | 4134 | 7 |
| 165.793686 | 20.59 | 42.39 | 22.72 | 57.48 | 4266 | 6 |
| 165.865234 | 23.44 | 42.68 | 26.06 | 59.92 | 4461 | 6 |
| 165.936905 | 26.99 | 43.64 | 25.99 | 63.62 | 4612 | 12 |
| 165.985931 | 30.07 | 57.31 | 41.14 | 88.38 | 1692 | 12 |
| 166.020187 | 31.53 | 50.28 | 36.42 | 80.22 | 2669 | 22 |
| 166.076523 | 30.49 | 55.11 | 44.88 | 88.52 | 4173 | 22 |
| 166.148361 | 26.37 | 45.26 | 43.34 | 75.74 | 4069 | 7 |
| 166.218491 | 24.53 | 38.97 | 42.43 | 68.24 | 4202 | 7 |
| 166.288300 | 23.89 | 36.63 | 46.05 | 69.29 | 4329 | 27 |
| 166.358551 | 18.18 | 30.09 | 52.15 | 68.35 | 4424 | 27 |
| 166.429153 | 16.12 | 31.97 | 47.83 | 66.46 | 4363 | 9 |
| 166.580887 | 20.03 | 45.97 | 37.16 | 69.08 | 3371 | 32 |
| 166.643051 | 21.65 | 50.51 | 49.12 | 79.14 | 4165 | 39 |
| 166.712509 | 19.11 | 47.37 | 55.49 | 81.18 | 4080 | 39 |
| 166.783035 | 22.60 | 50.79 | 53.88 | 84.60 | 4259 | 56 |
| 166.854462 | 24.59 | 49.15 | 48.82 | 80.19 | 4397 | 56 |
| 166.926208 | 30.28 | 49.11 | 47.69 | 82.88 | 4622 | 39 |
| 166.981903 | 29.16 | 52.34 | 38.82 | 81.65 | 2592 | 39 |
| 167.017181 | 37.11 | 49.18 | 46.71 | 85.74 | 1864 | 67 |
| 167.066605 | 28.44 | 48.21 | 46.49 | 82.75 | 4202 | 67 |
| 167.138687 | 25.67 | 46.04 | 40.98 | 74.75 | 4056 | 12 |
| 167.209015 | 25.85 | 35.52 | 45.82 | 70.01 | 4169 | 12 |
| 167.278732 | 24.97 | 35.51 | 46.70 | 69.76 | 4316 | 12 |
| 167.348877 | 17.36 | 32.16 | 44.23 | 63.75 | 4402 | 12 |
| 167.419449 | 16.51 | 31.78 | 51.55 | 69.22 | 4385 | 12 |
| 167.490097 | 18.24 | 38.90 | 48.26 | 72.20 | 4278 | 12 |
| 167.562317 | 22.68 | 46.55 | 45.32 | 77.82 | 4362 | 22 |
| 167.633423 | 20.20 | 46.94 | 51.01 | 80.14 | 4185 | 22 |
| 167.781403 | 26.00 | 55.92 | 45.41 | 86.84 | 3327 | 32 |
| 167.844406 | 20.00 | 58.22 | 50.73 | 91.61 | 4298 | 32 |
| 167.916229 | 24.67 | 53.60 | 51.11 | 89.33 | 4530 | 7 |
| 167.975769 | 23.38 | 62.87 | 52.17 | 94.08 | 3101 | 7 |
| 168.012238 | 36.48 | 28.99 | 9.64 | 51.19 | 1382 | 9 |
| 168.056778 | 29.77 | 54.56 | 38.02 | 82.34 | 4222 | 9 |
| 168.129028 | 27.89 | 45.12 | 30.24 | 69.09 | 4040 | 4 |
| 168.199463 | 26.39 | 40.50 | 23.96 | 60.09 | 4166 | 4 |
| 168.269196 | 26.31 | 37.76 | 17.79 | 54.59 | 4308 | 4 |
| 168.339264 | 19.89 | 34.48 | 19.86 | 49.82 | 4388 | 4 |
| 168.409760 | 15.19 | 30.36 | 19.69 | 43.81 | 4406 | 4 |
| 168.480438 | 17.38 | 31.63 | 20.26 | 46.28 | 4301 | 4 |
| 168.552536 | 21.71 | 43.15 | 16.44 | 55.60 | 4372 | 4 |
| 168.623810 | 21.56 | 47.39 | 16.95 | 58.75 | 4231 | 4 |
| 168.693756 | 15.60 | 42.55 | 16.27 | 50.76 | 3918 | 3 |
| 168.763702 | 18.59 | 42.50 | 26.93 | 60.21 | 4226 | 3 |
| 168.834717 | 18.94 | 44.09 | 25.03 | 59.08 | 4289 | 3 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 168.906464 | 22.81 | 47.14 | 30.43 | 66.29 | 4525 | 6 |
| 168.969574 | 23.97 | 56.07 | 34.57 | 77.59 | 3519 | 6 |
| 169.005569 | 39.64 | 27.05 | 9.48 | 51.75 | 950 | 5 |
| 169.046906 | 28.81 | 46.14 | 34.09 | 73.23 | 4249 | 5 |
| 169.119324 | 28.69 | 44.28 | 25.07 | 65.82 | 4039 | 5 |
| 169.189865 | 27.17 | 39.56 | 24.47 | 60.88 | 4134 | 3 |
| 169.259689 | 25.98 | 37.27 | 19.68 | 55.07 | 4300 | 4 |
| 169.329575 | 18.91 | 35.39 | 18.08 | 48.98 | 4354 | 4 |
| 169.400101 | 20.03 | 32.15 | 22.56 | 49.25 | 4199 | 4 |
| 169.470718 | 26.27 | 34.33 | 21.64 | 53.84 | 4304 | 4 |
| 169.542770 | 29.62 | 42.03 | 25.42 | 63.97 | 4381 | 7 |
| 169.614090 | 25.45 | 45.32 | 17.38 | 60.00 | 4248 | 7 |
| 169.684418 | 23.82 | 41.76 | 17.18 | 55.75 | 4005 | 9 |
| 169.754028 | 21.12 | 56.85 | 19.52 | 68.92 | 4212 | 6 |
| 169.824921 | 27.01 | 40.84 | 29.42 | 65.12 | 4278 | 6 |
| 169.896713 | 28.92 | 41.39 | 30.53 | 65.74 | 4515 | 7 |
| 169.966537 | 42.24 | 41.24 | 24.90 | 70.05 | 4373 | 7 |
| 170.000702 | 56.05 | 43.33 | 20.65 | 73.89 | 116 | 5 |
| 170.037064 | 47.39 | 44.83 | 27.58 | 78.91 | 4263 | 5 |
| 170.109589 | 48.53 | 46.78 | 27.73 | 81.09 | 4022 | 5 |
| 170.180283 | 38.73 | 44.55 | 25.01 | 71.06 | 4122 | 2 |
| 170.250183 | 39.87 | 40.84 | 17.98 | 65.68 | 4266 | 3 |
| 170.320007 | 33.53 | 37.42 | 19.71 | 59.89 | 4345 | 3 |
| 170.390503 | 29.60 | 32.09 | 19.56 | 52.52 | 4414 | 6 |
| 170.461090 | 26.47 | 32.40 | 22.61 | 53.65 | 4322 | 6 |
| 170.532928 | 30.72 | 42.00 | 20.50 | 62.01 | 4382 | 7 |
| 170.604385 | 27.05 | 46.94 | 22.38 | 63.86 | 4281 | 7 |
| 170.675018 | 28.94 | 45.54 | 16.42 | 61.80 | 4074 | 18 |
| 170.744354 | 20.77 | 52.33 | 25.72 | 68.79 | 4196 | 18 |
| 170.815231 | 21.89 | 53.45 | 32.37 | 74.49 | 4281 | 27 |
| 170.887085 | 29.80 | 48.85 | 37.82 | 76.21 | 4507 | 15 |
| 170.958527 | 39.05 | 50.35 | 32.06 | 79.51 | 4620 | 15 |
| 170.996521 | 22.33 | 31.41 | 19.79 | 46.06 | 594 | 15 |
| 171.033859 | 47.14 | 47.95 | 32.79 | 84.30 | 3649 | 12 |
| 171.099915 | 45.69 | 47.97 | 31.31 | 81.87 | 4019 | 12 |
| 171.170685 | 37.80 | 43.98 | 28.59 | 71.26 | 4108 | 15 |
| 171.240646 | 39.69 | 39.61 | 18.11 | 63.85 | 4247 | 15 |
| 171.310562 | 34.96 | 37.30 | 17.49 | 59.48 | 4388 | 2 |
| 171.380844 | 28.58 | 32.77 | 18.84 | 52.02 | 4420 | 3 |
| 171.451508 | 24.34 | 33.21 | 17.87 | 50.58 | 4323 | 3 |
| 171.523026 | 27.77 | 40.95 | 21.55 | 60.02 | 4373 | 2 |
| 171.594635 | 26.29 | 47.87 | 21.73 | 64.61 | 4304 | 2 |
| 171.665482 | 24.15 | 44.22 | 14.78 | 58.04 | 4105 | 7 |
| 171.734741 | 17.79 | 43.68 | 29.52 | 62.64 | 4166 | 7 |
| 171.805511 | 21.88 | 43.31 | 35.20 | 69.03 | 4276 | 6 |
| 171.877365 | 22.52 | 37.66 | 33.35 | 62.78 | 4473 | 5 |
| 171.948792 | 31.13 | 44.64 | 31.12 | 69.31 | 4625 | 5 |
| 171.989807 | 15.79 | 75.55 | 55.46 | 101.49 | 917 | 5 |
| 172.026443 | 36.02 | 42.70 | 31.82 | 73.04 | 3397 | 9 |
| 172.089035 | 34.36 | 40.25 | 34.80 | 74.71 | 4027 | 9 |
| 172.160034 | 28.48 | 41.02 | 29.06 | 65.63 | 4092 | 6 |
| 172.230087 | 28.38 | 39.84 | 20.17 | 59.59 | 4222 | 6 |
| 172.300018 | 26.23 | 40.40 | 17.21 | 57.25 | 4362 | 7 |
| 172.370316 | 18.41 | 34.47 | 21.10 | 49.63 | 4426 | 7 |
| 172.440887 | 17.72 | 31.78 | 21.59 | 47.16 | 4340 | 7 |
| 172.512070 | 22.37 | 35.42 | 25.42 | 54.29 | 4339 | 9 |
| 172.583939 | 22.56 | 45.81 | 19.22 | 59.33 | 4328 | 9 |
| 172.654831 | 18.89 | 45.27 | 18.55 | 56.80 | 4130 | 4 |
| 172.724152 | 16.22 | 41.88 | 28.48 | 58.82 | 4134 | 4 |
| 172.794785 | 19.10 | 42.24 | 29.37 | 61.08 | 4266 | 4 |
| 172.866455 | 20.94 | 41.83 | 28.82 | 60.87 | 4472 | 4 |
| 172.938110 | 27.45 | 41.64 | 24.24 | 61.83 | 4624 | 4 |
| 172.986023 | 22.62 | 46.35 | 41.09 | 69.75 | 1572 | 4 |
| 173.020966 | 35.28 | 42.28 | 15.94 | 63.62 | 2838 | 4 |
| 173.078751 | 32.02 | 41.27 | 30.13 | 69.98 | 4150 | 4 |
| 173.150406 | 28.20 | 43.23 | 26.17 | 64.78 | 4083 | 3 |
| 173.220581 | 25.28 | 37.86 | 18.58 | 53.58 | 4200 | 3 |
| 173.290375 | 25.88 | 37.86 | 26.07 | 60.31 | 4340 | 3 |
| 173.360672 | 18.77 | 32.97 | 22.17 | 49.18 | 4431 | 3 |
| 173.431229 | 18.33 | 33.98 | 18.64 | 47.44 | 4355 | 4 |
| 173.501892 | 22.18 | 33.75 | 24.67 | 53.79 | 4263 | 5 |

| | | | | | | |
|------------|-------|-------|-------|-------|------|----|
| 173.574219 | 24.04 | 45.68 | 20.60 | 59.88 | 4347 | 5 |
| 173.645172 | 19.90 | 44.58 | 17.84 | 55.94 | 4151 | 6 |
| 173.714615 | 16.51 | 45.76 | 18.84 | 55.65 | 4077 | 6 |
| 173.785110 | 16.38 | 45.87 | 27.02 | 61.04 | 4261 | 6 |
| 173.856659 | 17.25 | 48.28 | 27.50 | 63.50 | 4400 | 6 |
| 173.928253 | 22.07 | 53.83 | 30.77 | 74.43 | 4604 | 18 |
| 173.982819 | 22.80 | 65.42 | 36.35 | 87.03 | 2407 | 18 |
| 174.017746 | 30.97 | 40.50 | 44.76 | 76.34 | 2042 | 22 |
| 174.068741 | 27.70 | 50.34 | 45.27 | 82.24 | 4193 | 22 |
| 174.140793 | 25.29 | 43.44 | 43.44 | 72.86 | 4061 | 7 |
| 174.211090 | 24.73 | 37.76 | 41.49 | 66.12 | 4177 | 7 |
| 174.280823 | 23.38 | 35.16 | 45.47 | 67.19 | 4314 | 7 |
| 174.350998 | 15.81 | 33.75 | 47.11 | 64.08 | 4407 | 7 |
| 174.421555 | 16.51 | 35.18 | 53.61 | 69.71 | 4391 | 15 |
| 174.492188 | 19.35 | 35.78 | 46.20 | 66.42 | 4265 | 15 |
| 174.644287 | 20.06 | 41.96 | 42.82 | 68.84 | 3260 | 6 |
| 174.705154 | 19.24 | 47.86 | 49.86 | 78.70 | 4016 | 6 |
| 174.775436 | 23.01 | 45.22 | 53.03 | 81.57 | 4247 | 18 |
| 174.846588 | 20.83 | 42.65 | 46.70 | 73.90 | 4310 | 18 |
| 174.918304 | 26.67 | 42.62 | 46.67 | 78.14 | 4530 | 5 |
| 174.976776 | 27.92 | 53.99 | 37.46 | 80.48 | 2960 | 5 |
| 175.013138 | 44.40 | 29.73 | 8.06 | 58.06 | 1520 | 9 |
| 175.058914 | 30.45 | 48.80 | 30.81 | 73.82 | 4218 | 9 |
| 175.131119 | 29.38 | 44.43 | 25.72 | 67.72 | 4044 | 22 |
| 175.201538 | 24.89 | 45.42 | 31.70 | 68.66 | 4168 | 22 |
| 175.271301 | 26.24 | 34.86 | 22.53 | 56.59 | 4305 | 7 |
| 175.341370 | 16.76 | 34.50 | 16.36 | 45.49 | 4387 | 7 |
| 175.411865 | 15.73 | 32.31 | 16.94 | 43.36 | 4407 | 6 |
| 175.482559 | 18.43 | 33.67 | 19.62 | 47.77 | 4292 | 6 |
| 175.554688 | 30.62 | 53.50 | 40.51 | 80.49 | 4370 | 56 |
| 175.625885 | 25.04 | 48.74 | 24.08 | 64.36 | 4221 | 32 |
| 175.695862 | 16.95 | 42.72 | 16.52 | 51.69 | 3910 | 32 |
| 175.765808 | 18.98 | 63.43 | 38.93 | 86.35 | 4229 | 56 |
| 175.836823 | 20.40 | 66.03 | 32.90 | 82.81 | 4282 | 56 |
| 175.908569 | 29.42 | 63.60 | 40.27 | 89.69 | 4522 | 27 |
| 175.970123 | 37.46 | 65.06 | 43.37 | 95.73 | 3335 | 27 |
| 176.006607 | 37.60 | 35.03 | 48.95 | 75.69 | 1127 | 39 |
| 176.049057 | 29.39 | 61.73 | 33.60 | 87.04 | 4245 | 39 |
| 176.121475 | 28.74 | 43.03 | 24.17 | 62.88 | 4040 | 39 |
| 176.192001 | 23.89 | 41.96 | 28.59 | 62.59 | 4148 | 27 |
| 176.261765 | 27.08 | 47.24 | 43.55 | 76.56 | 4303 | 27 |
| 176.331741 | 19.60 | 35.37 | 26.01 | 54.99 | 4365 | 27 |
| 176.402252 | 16.52 | 35.19 | 21.94 | 50.33 | 4416 | 9 |
| 176.472870 | 16.27 | 37.62 | 24.12 | 52.17 | 4303 | 9 |
| 176.544922 | 21.80 | 45.72 | 22.10 | 60.00 | 4373 | 5 |
| 176.616211 | 21.81 | 50.07 | 21.27 | 62.98 | 4238 | 5 |
| 176.686462 | 16.30 | 46.93 | 16.69 | 55.62 | 3982 | 4 |
| 176.756104 | 19.68 | 44.46 | 21.55 | 59.03 | 4228 | 4 |
| 176.827072 | 21.49 | 44.33 | 23.16 | 60.33 | 4284 | 4 |
| 176.898849 | 27.39 | 40.48 | 28.06 | 64.62 | 4515 | 7 |
| 176.967361 | 36.46 | 42.68 | 20.43 | 65.76 | 4190 | 7 |
| 177.001740 | 45.92 | 63.52 | 20.41 | 81.30 | 293 | 5 |
| 177.039154 | 36.73 | 45.39 | 25.24 | 71.60 | 4253 | 5 |
| 177.111786 | 34.46 | 45.89 | 26.69 | 71.24 | 4029 | 5 |
| 177.182388 | 27.40 | 43.13 | 21.92 | 61.44 | 4128 | 3 |
| 177.252228 | 28.53 | 36.96 | 15.58 | 53.08 | 4277 | 3 |
| 177.322083 | 22.79 | 33.74 | 17.03 | 49.02 | 4350 | 3 |
| 177.392593 | 16.65 | 30.45 | 18.97 | 43.57 | 4416 | 3 |
| 177.463211 | 16.02 | 32.12 | 20.45 | 46.25 | 4320 | 3 |
| 177.535080 | 22.79 | 43.23 | 25.65 | 60.77 | 4386 | 3 |
| 177.606522 | 22.25 | 49.17 | 22.06 | 63.09 | 4269 | 3 |
| 177.677124 | 18.02 | 43.42 | 17.71 | 53.58 | 4061 | 3 |
| 177.746475 | 19.09 | 47.25 | 24.32 | 60.53 | 4195 | 3 |
| 177.817337 | 22.50 | 42.08 | 28.11 | 61.80 | 4285 | 6 |
| 177.889130 | 23.96 | 43.08 | 30.91 | 64.47 | 4510 | 18 |
| 177.960663 | 30.88 | 41.42 | 26.29 | 65.81 | 4620 | 18 |
| 177.997574 | 15.12 | 32.96 | 12.21 | 41.78 | 415 | 18 |
| 178.033798 | 37.57 | 52.98 | 31.13 | 80.89 | 3729 | 12 |
| 178.101013 | 33.88 | 49.28 | 49.74 | 88.29 | 4022 | 12 |
| 178.171783 | 29.39 | 52.39 | 59.00 | 91.81 | 4106 | 18 |
| 178.241776 | 32.30 | 42.17 | 50.28 | 79.08 | 4250 | 18 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 178.311707 | 25.77 | 45.12 | 46.17 | 77.62 | 4390 | 32 |
| 178.382019 | 20.42 | 48.36 | 57.04 | 85.81 | 4426 | 48 |
| 178.452667 | 17.79 | 55.80 | 53.72 | 90.34 | 4323 | 48 |
| 178.524185 | 20.63 | 59.87 | 45.16 | 87.74 | 4367 | 56 |
| 178.668289 | 23.06 | 60.44 | 49.17 | 94.18 | 3904 | 32 |
| 178.735870 | 24.58 | 76.49 | 57.86 | 112.90 | 4175 | 32 |
| 178.806671 | 24.92 | 67.59 | 57.62 | 105.39 | 4280 | 80 |
| 178.878571 | 24.84 | 69.65 | 59.37 | 107.53 | 4484 | 39 |
| 178.950027 | 33.39 | 71.28 | 50.51 | 106.06 | 4626 | 39 |
| 178.991119 | 35.95 | 81.36 | 54.94 | 118.95 | 929 | 39 |
| 179.028229 | 34.72 | 56.50 | 50.03 | 94.25 | 3425 | 32 |
| 179.091248 | 29.62 | 52.95 | 36.50 | 80.37 | 4020 | 32 |
| 179.162109 | 25.39 | 48.20 | 34.18 | 71.91 | 4083 | 12 |
| 179.232208 | 27.32 | 40.63 | 25.80 | 61.29 | 4227 | 12 |
| 179.302124 | 24.75 | 35.00 | 24.31 | 56.31 | 4371 | 15 |
| 179.372437 | 16.84 | 33.80 | 25.94 | 52.01 | 4430 | 15 |
| 179.442276 | 17.65 | 34.63 | 21.85 | 49.60 | 4231 | 9 |
| 179.514221 | 26.61 | 46.10 | 33.30 | 68.21 | 4347 | 22 |
| 179.586090 | 26.66 | 49.26 | 37.53 | 72.53 | 4320 | 22 |
| 179.656906 | 22.85 | 46.51 | 33.85 | 66.35 | 4119 | 15 |
| 179.726273 | 19.94 | 44.96 | 32.74 | 64.60 | 4143 | 15 |
| 179.796967 | 19.26 | 53.59 | 46.68 | 80.11 | 4271 | 15 |
| 179.868515 | 19.73 | 53.58 | 49.87 | 82.87 | 4488 | 15 |
| 179.940247 | 27.18 | 52.00 | 60.99 | 94.20 | 4623 | 22 |
| 179.986511 | 25.89 | 76.67 | 86.65 | 134.69 | 1391 | 22 |
| 180.021774 | 34.23 | 53.24 | 58.72 | 96.72 | 3014 | 15 |
| 180.080948 | 27.69 | 54.77 | 60.82 | 99.18 | 4141 | 15 |
| 180.152542 | 27.12 | 49.18 | 57.84 | 92.37 | 4086 | 15 |
| 180.222672 | 28.06 | 39.38 | 45.79 | 74.91 | 4209 | 15 |
| 180.292694 | 25.15 | 38.66 | 41.28 | 69.28 | 4257 | 5 |
| 180.362793 | 15.89 | 37.84 | 50.74 | 72.25 | 4433 | 5 |
| 180.433334 | 17.41 | 39.09 | 54.92 | 77.16 | 4359 | 5 |
| 180.504074 | 28.93 | 42.32 | 55.67 | 83.09 | 4276 | 7 |
| 180.576324 | 27.06 | 43.42 | 88.67 | 111.27 | 4344 | 7 |
| 180.647308 | 25.23 | 46.37 | 93.53 | 117.15 | 4147 | 7 |
| 180.716721 | 25.67 | 49.59 | 54.07 | 88.21 | 4089 | 7 |
| 180.790558 | 27.93 | 43.99 | 41.13 | 74.09 | 3191 | 7 |
| 180.858749 | 30.85 | 47.98 | 37.23 | 75.42 | 4431 | 7 |
| 180.930359 | 34.27 | 52.16 | 42.78 | 87.04 | 4593 | 15 |
| 180.983627 | 38.37 | 60.56 | 25.47 | 81.75 | 2228 | 15 |
| 181.018417 | 34.99 | 51.39 | 46.75 | 91.71 | 2206 | 18 |
| 181.070938 | 37.48 | 60.73 | 37.63 | 89.87 | 4194 | 18 |
| 181.142944 | 33.50 | 53.52 | 31.91 | 79.95 | 4060 | 9 |
| 181.213104 | 31.74 | 46.65 | 32.61 | 73.54 | 4190 | 9 |
| 181.282944 | 34.10 | 46.72 | 29.55 | 73.82 | 4321 | 12 |
| 181.360352 | 23.53 | 39.34 | 31.24 | 64.05 | 3518 | 12 |
| 181.423691 | 23.31 | 37.64 | 23.24 | 56.83 | 4391 | 4 |
| 181.494308 | 23.69 | 38.50 | 24.97 | 57.87 | 4272 | 4 |
| 181.566589 | 28.06 | 45.05 | 30.07 | 70.34 | 4357 | 6 |
| 181.637680 | 24.17 | 46.23 | 27.07 | 67.72 | 4185 | 5 |
| 181.707199 | 24.40 | 44.91 | 20.30 | 60.83 | 4026 | 5 |
| 181.777588 | 26.95 | 43.37 | 22.22 | 62.21 | 4254 | 3 |
| 181.848785 | 25.98 | 42.49 | 18.78 | 58.54 | 4330 | 3 |
| 181.920456 | 31.05 | 46.71 | 31.84 | 74.06 | 4536 | 5 |
| 181.978836 | 30.16 | 59.03 | 20.98 | 74.58 | 2948 | 5 |
| 182.015213 | 43.46 | 30.94 | 51.50 | 85.10 | 1525 | 2 |
| 182.061050 | 35.80 | 50.48 | 30.53 | 76.08 | 4221 | 2 |
| 182.133270 | 33.30 | 47.03 | 28.36 | 71.86 | 4048 | 2 |
| 182.203766 | 29.08 | 42.67 | 32.75 | 68.89 | 4107 | 2 |
| 182.273361 | 32.65 | 37.86 | 35.30 | 68.41 | 4297 | 2 |
| 182.343475 | 25.50 | 35.42 | 34.93 | 64.09 | 4395 | 2 |
| 182.414001 | 22.40 | 34.24 | 32.65 | 59.70 | 4401 | 5 |
| 182.484695 | 24.13 | 35.39 | 24.69 | 56.16 | 4287 | 5 |
| 182.556839 | 20.67 | 45.55 | 18.81 | 58.41 | 4372 | 4 |
| 182.628036 | 22.58 | 48.94 | 17.45 | 59.85 | 4217 | 5 |
| 182.698029 | 16.06 | 42.28 | 17.44 | 51.00 | 3914 | 5 |
| 182.767883 | 18.41 | 44.31 | 23.74 | 58.75 | 4226 | 9 |
| 182.838928 | 21.89 | 42.36 | 21.56 | 58.32 | 4292 | 9 |
| 182.910690 | 26.79 | 46.62 | 26.24 | 65.98 | 4525 | 6 |
| 182.971313 | 33.41 | 57.09 | 26.77 | 78.37 | 3233 | 6 |
| 183.008072 | 37.22 | 27.09 | 18.68 | 52.49 | 1237 | 9 |

| | | | | | | |
|------------|-------|-------|-------|-------|------|----|
| 183.051178 | 32.24 | 54.13 | 31.75 | 79.16 | 4234 | 9 |
| 183.123611 | 30.09 | 45.09 | 26.99 | 67.52 | 4043 | 9 |
| 183.194092 | 26.22 | 38.98 | 25.33 | 60.01 | 4155 | 4 |
| 183.263840 | 26.70 | 36.83 | 24.18 | 57.04 | 4300 | 9 |
| 183.333801 | 21.13 | 34.62 | 20.58 | 51.30 | 4368 | 9 |
| 183.404358 | 16.15 | 31.87 | 18.69 | 43.90 | 4417 | 5 |
| 183.479523 | 20.39 | 30.50 | 16.59 | 44.83 | 3685 | 5 |
| 183.547043 | 23.53 | 42.73 | 18.33 | 56.60 | 4373 | 4 |
| 183.618362 | 23.64 | 45.37 | 18.92 | 58.22 | 4238 | 4 |
| 183.688522 | 17.28 | 41.81 | 17.77 | 52.39 | 3948 | 3 |
| 183.758240 | 17.73 | 48.43 | 24.37 | 60.84 | 4215 | 12 |
| 183.829208 | 19.64 | 42.43 | 30.60 | 63.49 | 4291 | 12 |
| 183.900955 | 25.92 | 41.26 | 32.23 | 65.26 | 4514 | 9 |
| 183.968048 | 32.91 | 44.65 | 22.91 | 66.13 | 4006 | 9 |
| 184.002792 | 50.41 | 31.86 | 20.53 | 64.93 | 474 | 4 |
| 184.041382 | 36.26 | 46.22 | 23.90 | 71.36 | 4260 | 4 |
| 184.113953 | 34.86 | 44.50 | 26.26 | 70.91 | 4030 | 4 |
| 184.184509 | 29.37 | 43.12 | 24.48 | 63.96 | 4133 | 6 |
| 184.254318 | 29.41 | 37.53 | 15.59 | 54.88 | 4285 | 4 |
| 184.324219 | 23.95 | 36.77 | 19.89 | 52.94 | 4351 | 4 |
| 184.394714 | 17.93 | 33.28 | 16.50 | 45.13 | 4415 | 3 |
| 184.465317 | 20.58 | 31.62 | 21.76 | 48.93 | 4313 | 3 |
| 184.537216 | 24.92 | 41.25 | 17.90 | 56.68 | 4386 | 4 |
| 184.608688 | 23.63 | 46.07 | 20.06 | 59.63 | 4261 | 4 |
| 184.679230 | 19.44 | 41.59 | 22.23 | 54.46 | 4051 | 5 |
| 184.748611 | 18.60 | 42.60 | 22.53 | 55.89 | 4196 | 5 |
| 184.819458 | 20.87 | 43.66 | 26.59 | 60.43 | 4291 | 4 |
| 184.891266 | 25.29 | 42.62 | 27.10 | 61.61 | 4516 | 4 |
| 184.962845 | 34.68 | 43.07 | 22.84 | 66.12 | 4625 | 4 |
| 184.998596 | 20.36 | 26.23 | 8.10 | 37.14 | 235 | 4 |
| 185.034302 | 35.86 | 47.62 | 30.85 | 76.12 | 3885 | 7 |
| 185.103165 | 33.20 | 43.74 | 25.51 | 69.30 | 4021 | 7 |
| 185.173859 | 28.98 | 43.25 | 27.87 | 65.92 | 4109 | 6 |
| 185.243896 | 30.41 | 38.38 | 20.45 | 58.40 | 4245 | 6 |
| 185.313721 | 23.44 | 35.75 | 24.44 | 55.34 | 4352 | 5 |
| 185.384125 | 17.87 | 32.15 | 22.13 | 46.70 | 4422 | 7 |
| 185.454773 | 19.38 | 33.48 | 24.52 | 50.62 | 4309 | 7 |
| 185.526337 | 25.68 | 39.23 | 30.87 | 62.08 | 4375 | 12 |
| 185.597961 | 23.57 | 49.01 | 18.68 | 60.96 | 4292 | 12 |
| 185.668655 | 20.20 | 45.07 | 16.10 | 55.68 | 4091 | 6 |
| 185.737976 | 19.42 | 47.25 | 20.03 | 59.03 | 4174 | 6 |
| 185.808792 | 21.44 | 43.61 | 25.92 | 61.44 | 4279 | 7 |
| 185.880722 | 23.86 | 37.73 | 30.85 | 62.49 | 4492 | 12 |
| 185.952148 | 29.13 | 45.91 | 25.20 | 66.64 | 4621 | 12 |
| 185.991013 | 15.08 | 44.47 | 21.67 | 54.67 | 714 | 12 |
| 186.028870 | 36.85 | 48.72 | 32.66 | 79.19 | 3579 | 9 |
| 186.093460 | 29.17 | 45.89 | 31.67 | 71.83 | 4018 | 9 |
| 186.164307 | 26.38 | 43.44 | 29.21 | 67.08 | 4103 | 7 |
| 186.234360 | 26.36 | 40.02 | 17.40 | 56.53 | 4229 | 7 |
| 186.304230 | 20.94 | 37.10 | 15.49 | 50.34 | 4375 | 3 |
| 186.374542 | 16.16 | 33.69 | 16.38 | 44.50 | 4430 | 3 |
| 186.445175 | 17.03 | 34.38 | 18.50 | 47.22 | 4332 | 7 |
| 186.516464 | 20.70 | 38.89 | 22.14 | 54.41 | 4359 | 18 |
| 186.588257 | 24.38 | 50.44 | 18.07 | 63.03 | 4320 | 18 |
| 186.659073 | 19.77 | 43.88 | 14.51 | 54.00 | 4118 | 7 |
| 186.728424 | 17.38 | 44.73 | 24.13 | 59.55 | 4148 | 7 |
| 186.799088 | 19.51 | 46.69 | 29.19 | 64.38 | 4277 | 7 |
| 186.870636 | 18.38 | 52.76 | 29.38 | 68.52 | 4507 | 7 |
| 186.942429 | 23.25 | 45.68 | 29.43 | 66.10 | 4613 | 6 |
| 186.986908 | 24.43 | 50.03 | 61.23 | 92.16 | 1212 | 6 |
| 187.022644 | 31.03 | 42.20 | 27.27 | 67.92 | 3187 | 5 |
| 187.083328 | 27.42 | 45.21 | 29.40 | 69.71 | 4103 | 5 |
| 187.154709 | 23.98 | 41.99 | 28.93 | 64.48 | 4094 | 6 |
| 187.224808 | 23.76 | 37.91 | 20.09 | 54.46 | 4214 | 6 |
| 187.294647 | 19.17 | 37.38 | 19.03 | 51.22 | 4354 | 9 |
| 187.364960 | 13.74 | 39.73 | 24.41 | 54.04 | 4426 | 9 |
| 187.435471 | 14.22 | 33.91 | 24.07 | 49.30 | 4356 | 12 |
| 187.506348 | 17.11 | 36.29 | 23.06 | 51.68 | 4290 | 18 |
| 187.578491 | 22.03 | 48.50 | 23.39 | 64.77 | 4335 | 18 |
| 187.649445 | 20.32 | 47.12 | 22.00 | 59.90 | 4146 | 15 |
| 187.718826 | 18.54 | 48.76 | 21.68 | 61.35 | 4094 | 15 |

| | | | | | | |
|------------|-------|-------|-------|-------|------|----|
| 187.789383 | 19.41 | 49.58 | 26.60 | 65.19 | 4262 | 6 |
| 187.860916 | 17.98 | 43.35 | 25.70 | 61.52 | 4424 | 6 |
| 187.932648 | 23.16 | 50.70 | 27.46 | 68.64 | 4613 | 3 |
| 187.984451 | 24.04 | 51.42 | 39.87 | 75.86 | 2049 | 3 |
| 188.019119 | 27.08 | 40.30 | 19.67 | 60.08 | 2381 | 3 |
| 188.073135 | 26.84 | 43.94 | 31.70 | 68.75 | 4188 | 3 |
| 188.145096 | 22.81 | 43.88 | 27.54 | 64.41 | 4065 | 5 |
| 188.215317 | 23.40 | 36.92 | 22.05 | 54.49 | 4186 | 5 |
| 188.285065 | 20.63 | 33.98 | 16.21 | 48.93 | 4328 | 5 |
| 188.355270 | 14.39 | 33.15 | 19.41 | 45.54 | 4416 | 5 |
| 188.425812 | 14.08 | 31.63 | 19.01 | 44.90 | 4389 | 4 |
| 188.496445 | 18.00 | 32.88 | 26.55 | 52.12 | 4266 | 4 |
| 188.568756 | 25.65 | 40.29 | 26.49 | 61.05 | 4351 | 7 |
| 188.639801 | 21.43 | 44.69 | 18.52 | 56.71 | 4180 | 6 |
| 188.709381 | 19.40 | 44.39 | 24.03 | 60.57 | 4031 | 6 |
| 188.779724 | 21.39 | 50.34 | 25.77 | 66.90 | 4249 | 7 |
| 188.851013 | 17.74 | 47.58 | 24.70 | 61.89 | 4352 | 7 |
| 188.922745 | 23.11 | 44.38 | 33.16 | 67.59 | 4563 | 5 |
| 188.980560 | 18.69 | 58.26 | 38.42 | 79.76 | 2887 | 5 |
| 189.016800 | 36.20 | 39.98 | 11.58 | 59.67 | 1578 | 7 |
| 189.063278 | 24.34 | 45.20 | 33.43 | 70.02 | 4211 | 7 |
| 189.133331 | 23.26 | 41.85 | 27.84 | 63.03 | 3779 | 5 |
| 189.207657 | 30.54 | 39.61 | 22.25 | 60.48 | 3949 | 5 |
| 189.275467 | 29.75 | 34.96 | 16.72 | 53.50 | 4306 | 4 |
| 189.345566 | 22.22 | 32.74 | 17.24 | 47.85 | 4387 | 4 |
| 189.416122 | 20.05 | 29.78 | 14.45 | 42.10 | 4409 | 5 |
| 189.486816 | 22.78 | 32.93 | 19.31 | 50.38 | 4282 | 5 |
| 189.559021 | 23.15 | 44.19 | 20.43 | 58.06 | 4375 | 4 |
| 189.630157 | 24.76 | 47.38 | 19.21 | 61.53 | 4213 | 4 |
| 189.700150 | 18.76 | 41.92 | 18.63 | 52.75 | 3918 | 4 |
| 189.770065 | 18.80 | 40.31 | 26.40 | 57.57 | 4232 | 6 |
| 189.841049 | 20.94 | 38.27 | 27.60 | 57.71 | 4282 | 6 |
| 189.912842 | 25.63 | 42.93 | 29.35 | 64.30 | 4525 | 6 |
| 189.973282 | 28.77 | 48.27 | 26.75 | 67.73 | 3207 | 6 |
| 190.009964 | 40.44 | 25.93 | 16.22 | 54.50 | 1259 | 6 |
| 190.053345 | 33.88 | 46.73 | 26.22 | 71.38 | 4238 | 6 |
| 190.125732 | 33.46 | 44.02 | 28.93 | 70.46 | 4040 | 7 |
| 190.196198 | 27.61 | 40.59 | 25.86 | 62.13 | 4156 | 7 |
| 190.265945 | 30.34 | 36.58 | 14.15 | 54.31 | 4300 | 3 |
| 190.335968 | 21.99 | 36.44 | 15.81 | 50.72 | 4379 | 3 |
| 190.406479 | 19.93 | 32.48 | 18.93 | 47.15 | 4408 | 6 |
| 190.477112 | 20.89 | 34.45 | 23.80 | 52.77 | 4290 | 6 |
| 190.549179 | 23.69 | 43.43 | 23.70 | 60.07 | 4376 | 9 |
| 190.620514 | 23.16 | 46.02 | 21.74 | 60.11 | 4228 | 9 |
| 190.690567 | 18.57 | 41.84 | 21.69 | 53.92 | 3936 | 9 |
| 190.760284 | 15.69 | 50.09 | 27.55 | 63.13 | 4223 | 6 |
| 190.831345 | 19.19 | 48.96 | 26.73 | 65.68 | 4287 | 6 |
| 190.903061 | 24.59 | 46.14 | 32.62 | 69.14 | 4514 | 2 |
| 190.968765 | 31.82 | 43.19 | 28.77 | 69.61 | 3830 | 2 |
| 191.003479 | 57.45 | 25.50 | 13.01 | 65.89 | 591 | 3 |
| 191.042480 | 39.03 | 45.23 | 31.91 | 76.91 | 4253 | 3 |
| 191.115021 | 41.06 | 44.66 | 23.45 | 72.98 | 4036 | 3 |
| 191.185593 | 34.27 | 41.39 | 25.50 | 66.76 | 4135 | 4 |
| 191.255463 | 35.40 | 38.46 | 17.51 | 60.81 | 4293 | 6 |
| 191.325394 | 28.98 | 34.72 | 18.60 | 54.34 | 4360 | 6 |
| 191.395874 | 26.18 | 32.26 | 16.47 | 48.55 | 4415 | 6 |
| 191.466446 | 24.42 | 34.02 | 20.36 | 51.54 | 4313 | 6 |
| 191.538422 | 27.23 | 43.40 | 21.19 | 61.33 | 4383 | 6 |
| 191.609818 | 25.58 | 46.05 | 18.59 | 60.45 | 4257 | 6 |
| 191.680283 | 23.37 | 41.98 | 17.54 | 55.31 | 4044 | 5 |
| 191.749710 | 18.08 | 46.19 | 29.99 | 62.74 | 4195 | 5 |
| 191.820679 | 18.34 | 46.77 | 26.69 | 62.52 | 4276 | 6 |
| 191.892441 | 27.79 | 40.51 | 30.73 | 64.25 | 4517 | 9 |
| 191.964020 | 36.26 | 47.18 | 28.87 | 72.56 | 4604 | 9 |
| 191.999298 | 25.31 | 50.53 | 20.71 | 60.76 | 118 | 9 |
| 192.034836 | 39.26 | 52.78 | 28.88 | 81.07 | 4033 | 6 |
| 192.105316 | 43.73 | 44.64 | 31.47 | 79.33 | 4022 | 6 |
| 192.176041 | 34.22 | 42.56 | 25.62 | 67.62 | 4109 | 9 |
| 192.245972 | 37.40 | 35.98 | 27.21 | 64.93 | 4258 | 9 |
| 192.315826 | 28.72 | 37.57 | 32.97 | 65.25 | 4366 | 27 |
| 192.386261 | 24.85 | 32.70 | 22.07 | 53.71 | 4424 | 18 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|-----|
| 192.456833 | 24.58 | 31.61 | 20.35 | 49.57 | 4340 | 18 |
| 192.528549 | 28.97 | 39.56 | 25.21 | 61.45 | 4376 | 22 |
| 192.600113 | 26.61 | 47.81 | 21.84 | 63.09 | 4292 | 22 |
| 192.670746 | 27.28 | 43.44 | 20.77 | 59.62 | 4081 | 22 |
| 192.740128 | 18.73 | 45.42 | 27.10 | 60.47 | 4183 | 22 |
| 192.810944 | 21.00 | 57.02 | 24.57 | 71.42 | 4279 | 39 |
| 192.882812 | 24.31 | 41.53 | 34.26 | 66.79 | 4505 | 15 |
| 192.954330 | 29.77 | 38.79 | 30.71 | 67.77 | 4634 | 15 |
| 192.992981 | 16.00 | 40.08 | 16.31 | 48.05 | 701 | 15 |
| 193.030609 | 43.55 | 46.60 | 22.76 | 76.60 | 3629 | 18 |
| 193.095612 | 36.87 | 43.17 | 26.64 | 72.24 | 4019 | 18 |
| 193.166443 | 31.96 | 49.82 | 29.12 | 74.93 | 4105 | 32 |
| 193.236465 | 27.70 | 54.82 | 25.04 | 72.99 | 4235 | 32 |
| 193.306320 | 25.66 | 40.74 | 20.87 | 58.76 | 4371 | 18 |
| 193.376648 | 20.33 | 34.64 | 21.65 | 50.52 | 4424 | 32 |
| 193.447266 | 22.62 | 36.14 | 23.19 | 53.23 | 4337 | 32 |
| 193.518616 | 26.19 | 40.72 | 30.77 | 63.28 | 4357 | 56 |
| 193.590363 | 24.57 | 44.26 | 22.95 | 60.10 | 4319 | 56 |
| 193.661209 | 21.31 | 43.35 | 19.24 | 56.05 | 4117 | 32 |
| 193.730515 | 16.75 | 64.02 | 36.65 | 82.22 | 4137 | 32 |
| 193.801224 | 17.18 | 60.81 | 36.97 | 81.36 | 4278 | 32 |
| 193.872955 | 21.80 | 58.94 | 34.29 | 79.95 | 4476 | 32 |
| 193.944550 | 28.47 | 54.52 | 35.67 | 80.59 | 4618 | 48 |
| 193.986984 | 17.92 | 119.56 | 37.82 | 136.49 | 1034 | 48 |
| 194.023483 | 39.47 | 46.28 | 48.93 | 91.32 | 3358 | 22 |
| 194.085632 | 32.13 | 49.61 | 34.54 | 76.08 | 4078 | 22 |
| 194.156815 | 32.45 | 45.27 | 28.39 | 68.99 | 4091 | 12 |
| 194.226913 | 30.97 | 37.24 | 23.20 | 58.27 | 4217 | 12 |
| 194.296753 | 28.46 | 38.04 | 17.84 | 55.75 | 4355 | 5 |
| 194.367050 | 22.96 | 33.02 | 17.80 | 49.30 | 4431 | 5 |
| 194.437637 | 20.44 | 30.43 | 19.40 | 46.15 | 4343 | 9 |
| 194.508636 | 22.67 | 36.66 | 24.88 | 55.11 | 4311 | 3 |
| 194.580627 | 23.76 | 45.83 | 18.96 | 59.62 | 4331 | 3 |
| 194.651596 | 21.06 | 43.35 | 18.67 | 56.01 | 4143 | 6 |
| 194.720947 | 18.03 | 58.14 | 30.98 | 72.82 | 4106 | 6 |
| 194.791534 | 19.03 | 61.13 | 32.89 | 78.69 | 4273 | 6 |
| 194.863083 | 23.19 | 55.38 | 34.26 | 76.42 | 4437 | 6 |
| 194.934784 | 30.57 | 50.85 | 32.68 | 76.10 | 4615 | 6 |
| 194.985260 | 35.29 | 55.98 | 49.76 | 90.56 | 1869 | 6 |
| 195.019836 | 33.73 | 41.90 | 32.17 | 70.79 | 2553 | 4 |
| 195.075317 | 34.07 | 47.94 | 38.58 | 80.87 | 4179 | 4 |
| 195.147186 | 29.95 | 45.21 | 40.49 | 75.30 | 4073 | 7 |
| 195.217361 | 28.23 | 39.14 | 42.39 | 70.40 | 4199 | 7 |
| 195.287155 | 26.95 | 38.47 | 50.47 | 75.22 | 4331 | 9 |
| 195.357391 | 19.93 | 28.36 | 51.07 | 67.20 | 4427 | 9 |
| 195.427933 | 20.64 | 42.52 | 53.39 | 77.94 | 4377 | 67 |
| 195.498611 | 23.40 | 48.73 | 44.33 | 77.91 | 4261 | 67 |
| 195.570908 | 24.36 | 51.82 | 48.35 | 85.28 | 4350 | 132 |
| 195.641937 | 24.88 | 48.40 | 74.04 | 106.89 | 4163 | 94 |
| 195.788269 | 16.52 | 46.46 | 53.91 | 81.70 | 3513 | 12 |
| 195.853088 | 17.38 | 48.58 | 48.02 | 81.59 | 4368 | 12 |
| 195.924820 | 25.63 | 54.66 | 49.72 | 90.67 | 4554 | 15 |
| 195.981476 | 20.41 | 63.98 | 45.43 | 90.74 | 2706 | 15 |
| 196.016800 | 40.42 | 40.41 | 20.32 | 66.95 | 1686 | 15 |
| 196.064438 | 29.79 | 58.32 | 34.73 | 85.01 | 4208 | 15 |
| 196.136490 | 29.54 | 47.60 | 34.13 | 73.67 | 4047 | 15 |
| 196.206879 | 28.39 | 43.10 | 31.28 | 66.97 | 4169 | 15 |
| 196.276642 | 27.36 | 39.96 | 27.53 | 61.17 | 4314 | 18 |
| 196.346786 | 18.91 | 35.96 | 24.52 | 52.86 | 4398 | 18 |
| 196.417328 | 14.67 | 35.93 | 22.71 | 50.92 | 4404 | 27 |
| 196.487961 | 16.90 | 42.25 | 29.34 | 59.91 | 4286 | 27 |
| 196.560165 | 21.73 | 50.45 | 21.83 | 65.08 | 4367 | 27 |
| 196.631317 | 21.29 | 54.83 | 24.23 | 67.69 | 4208 | 154 |
| 196.701187 | 17.96 | 44.80 | 22.75 | 57.66 | 3940 | 154 |
| 196.771210 | 22.74 | 77.14 | 68.04 | 114.68 | 4243 | 111 |
| 196.842209 | 25.72 | 68.87 | 53.45 | 96.83 | 4296 | 111 |
| 196.914047 | 30.51 | 50.82 | 23.93 | 72.13 | 4521 | 39 |
| 196.975006 | 35.94 | 47.62 | 12.42 | 67.12 | 3277 | 39 |
| 197.011627 | 34.38 | 46.64 | 31.52 | 70.68 | 1218 | 15 |
| 197.054565 | 31.96 | 54.69 | 28.95 | 77.30 | 4227 | 15 |
| 197.126892 | 29.44 | 50.72 | 29.39 | 72.50 | 4028 | 22 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|-----|
| 197.197342 | 28.92 | 42.10 | 33.64 | 68.69 | 4162 | 22 |
| 197.267120 | 26.36 | 40.02 | 18.26 | 55.70 | 4302 | 39 |
| 197.337143 | 20.35 | 44.27 | 27.52 | 63.04 | 4380 | 39 |
| 197.407684 | 15.03 | 47.75 | 34.79 | 69.36 | 4411 | 32 |
| 197.478317 | 19.92 | 54.06 | 42.61 | 79.81 | 4294 | 32 |
| 197.550430 | 23.37 | 81.93 | 46.01 | 106.93 | 4368 | 207 |
| 197.621674 | 34.93 | 59.99 | 33.45 | 85.68 | 4226 | 207 |
| 197.691650 | 24.24 | 97.94 | 62.67 | 133.52 | 3917 | 300 |
| 197.761566 | 41.45 | 81.33 | 83.55 | 139.27 | 4229 | 400 |
| 197.832520 | 46.13 | 270.16 | 118.07 | 319.76 | 4279 | 400 |
| 197.904266 | 81.81 | 315.98 | 171.10 | 427.34 | 4492 | 300 |
| 197.968933 | 85.77 | 234.30 | 135.14 | 330.62 | 3696 | 300 |
| 198.004517 | 53.78 | 422.01 | 71.97 | 432.92 | 772 | 179 |
| 198.044922 | 62.86 | 247.32 | 70.71 | 279.17 | 4215 | 179 |
| 198.117249 | 61.46 | 186.10 | 61.09 | 217.49 | 4033 | 179 |
| 198.187775 | 50.52 | 145.07 | 70.06 | 181.62 | 4140 | 80 |
| 198.257614 | 56.78 | 122.45 | 55.21 | 158.09 | 4287 | 32 |
| 198.327530 | 44.34 | 113.52 | 54.24 | 144.11 | 4361 | 32 |
| 198.398026 | 37.09 | 110.58 | 52.60 | 138.07 | 4413 | 39 |
| 198.468643 | 34.78 | 112.34 | 33.43 | 130.82 | 4313 | 39 |
| 198.540726 | 30.68 | 100.70 | 28.04 | 118.10 | 4377 | 39 |
| 198.612015 | 29.40 | 103.36 | 21.51 | 120.40 | 4255 | 39 |
| 198.682404 | 30.47 | 96.98 | 20.96 | 117.32 | 4014 | 15 |
| 198.751892 | 34.08 | 98.21 | 43.98 | 133.82 | 4216 | 7 |
| 198.824646 | 28.99 | 90.63 | 23.82 | 108.64 | 3852 | 7 |
| 198.894592 | 45.66 | 82.31 | 34.47 | 117.29 | 4513 | 6 |
| 198.965714 | 51.43 | 79.16 | 25.92 | 111.74 | 4556 | 6 |
| 199.035507 | 49.14 | 78.68 | 25.92 | 106.56 | 4208 | 15 |
| 199.107483 | 57.57 | 77.14 | 35.12 | 110.60 | 4022 | 15 |
| 199.178146 | 51.56 | 67.47 | 29.46 | 97.71 | 4117 | 12 |
| 199.248077 | 55.71 | 60.84 | 30.40 | 93.74 | 4260 | 12 |
| 199.318008 | 48.26 | 58.46 | 26.05 | 86.64 | 4382 | 9 |
| 199.380463 | 42.93 | 55.54 | 26.73 | 81.83 | 3495 | 9 |
| 199.458984 | 39.19 | 57.81 | 26.62 | 81.21 | 4326 | 9 |
| 199.530777 | 42.58 | 61.87 | 29.06 | 87.82 | 4382 | 9 |
| 199.602310 | 40.74 | 68.75 | 22.42 | 89.40 | 4284 | 9 |
| 199.672943 | 44.09 | 61.69 | 17.52 | 85.12 | 4077 | 5 |
| 199.742310 | 38.37 | 55.01 | 29.62 | 84.36 | 4181 | 5 |
| 199.813141 | 41.81 | 51.85 | 30.42 | 86.01 | 4277 | 4 |
| 199.885056 | 46.69 | 52.13 | 33.32 | 86.80 | 4436 | 5 |
| 199.956512 | 56.31 | 52.65 | 25.29 | 89.02 | 4628 | 5 |
| 199.994949 | 39.82 | 42.71 | 21.84 | 71.19 | 681 | 5 |
| 200.032623 | 58.20 | 64.33 | 27.71 | 98.63 | 3634 | 6 |
| 200.097794 | 56.97 | 58.10 | 34.31 | 96.35 | 4021 | 6 |
| 200.168594 | 48.66 | 53.16 | 32.01 | 85.70 | 4103 | 9 |
| 200.238571 | 47.29 | 49.27 | 36.05 | 83.83 | 4239 | 9 |
| 200.308502 | 43.24 | 47.26 | 19.92 | 73.44 | 4382 | 9 |
| 200.378799 | 38.13 | 44.15 | 20.34 | 67.22 | 4426 | 5 |
| 200.449432 | 34.86 | 43.41 | 26.67 | 68.44 | 4329 | 5 |
| 200.520828 | 37.86 | 48.18 | 28.80 | 75.35 | 4363 | 15 |
| 200.592545 | 33.78 | 53.85 | 21.92 | 74.07 | 4311 | 15 |
| 200.663361 | 34.43 | 52.33 | 18.76 | 71.82 | 4111 | 15 |
| 200.732681 | 27.24 | 51.93 | 23.81 | 70.10 | 4144 | 15 |
| 200.803436 | 31.55 | 46.10 | 24.97 | 69.74 | 4271 | 15 |
| 200.875000 | 42.42 | 50.94 | 28.21 | 79.49 | 4504 | 18 |
| 200.946716 | 48.99 | 47.45 | 26.09 | 81.54 | 4622 | 18 |
| 200.987717 | 53.84 | 51.19 | 15.91 | 84.24 | 917 | 18 |
| 201.024353 | 54.13 | 55.73 | 29.02 | 89.74 | 3411 | 9 |
| 201.086975 | 52.79 | 56.13 | 31.16 | 92.14 | 4045 | 9 |
| 201.157944 | 46.24 | 51.98 | 27.71 | 81.29 | 4087 | 4 |
| 201.228043 | 43.41 | 43.98 | 21.74 | 70.82 | 4215 | 4 |
| 201.297943 | 45.20 | 42.71 | 15.34 | 69.98 | 4358 | 3 |
| 201.368256 | 36.48 | 39.87 | 19.83 | 63.28 | 4433 | 3 |
| 201.438812 | 31.90 | 38.88 | 29.23 | 65.56 | 4345 | 4 |
| 201.509933 | 31.46 | 47.12 | 29.74 | 70.57 | 4335 | 7 |
| 201.581894 | 27.55 | 54.44 | 18.87 | 69.98 | 4323 | 7 |
| 201.652771 | 32.80 | 49.62 | 20.61 | 69.93 | 4141 | 32 |
| 201.722107 | 29.10 | 48.89 | 25.98 | 68.84 | 4111 | 32 |
| 201.792709 | 33.76 | 51.00 | 27.84 | 73.41 | 4266 | 22 |
| 201.864304 | 38.86 | 43.69 | 38.73 | 79.53 | 4464 | 22 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 201.935989 | 49.26 | 60.46 | 42.13 | 98.90 | 4602 | 32 |
| 201.985474 | 44.44 | 62.71 | 41.77 | 98.55 | 1751 | 32 |
| 202.020203 | 50.96 | 48.95 | 22.99 | 80.29 | 2669 | 39 |
| 202.076569 | 50.09 | 69.65 | 44.06 | 106.37 | 4161 | 39 |
| 202.148361 | 46.78 | 71.64 | 59.31 | 116.95 | 4082 | 80 |
| 202.218536 | 46.93 | 65.26 | 51.42 | 105.93 | 4202 | 80 |
| 202.288361 | 44.77 | 73.99 | 51.77 | 111.35 | 4334 | 56 |
| 202.358612 | 39.18 | 95.70 | 58.23 | 131.09 | 4423 | 56 |
| 202.429169 | 33.35 | 91.59 | 45.79 | 116.37 | 4371 | 48 |
| 202.499771 | 27.03 | 63.21 | 46.74 | 93.70 | 4259 | 48 |
| 202.572144 | 30.76 | 71.78 | 46.80 | 103.64 | 4342 | 27 |
| 202.643112 | 31.73 | 74.33 | 19.95 | 89.69 | 4150 | 9 |
| 202.712601 | 31.71 | 68.90 | 21.87 | 88.04 | 4061 | 9 |
| 202.783005 | 32.01 | 59.67 | 33.72 | 89.48 | 4255 | 18 |
| 202.854370 | 35.44 | 61.31 | 26.32 | 86.93 | 4382 | 18 |
| 202.926254 | 37.58 | 68.25 | 28.03 | 90.24 | 4594 | 15 |
| 202.981934 | 33.63 | 80.41 | 44.47 | 107.44 | 2585 | 15 |
| 203.017303 | 42.60 | 53.42 | 19.68 | 78.00 | 1861 | 12 |
| 203.066635 | 32.32 | 67.00 | 33.89 | 89.27 | 4208 | 12 |
| 203.138733 | 31.53 | 54.47 | 36.71 | 81.28 | 4057 | 7 |
| 203.209000 | 32.70 | 45.44 | 28.03 | 70.66 | 4172 | 7 |
| 203.278793 | 31.74 | 44.53 | 18.50 | 64.13 | 4314 | 4 |
| 203.348953 | 22.75 | 41.15 | 22.75 | 60.01 | 4403 | 4 |
| 203.419495 | 18.58 | 37.11 | 26.90 | 56.27 | 4398 | 5 |
| 203.490173 | 19.33 | 43.16 | 33.91 | 64.93 | 4269 | 5 |
| 203.562378 | 22.61 | 51.13 | 18.30 | 64.76 | 4362 | 9 |
| 203.633514 | 20.86 | 54.64 | 18.56 | 65.96 | 4206 | 5 |
| 203.703339 | 16.74 | 53.43 | 25.25 | 66.76 | 3962 | 5 |
| 203.773407 | 21.50 | 52.94 | 25.27 | 69.88 | 4247 | 5 |
| 203.844406 | 24.09 | 50.72 | 20.05 | 65.90 | 4295 | 5 |
| 203.910095 | 28.83 | 50.45 | 23.60 | 69.56 | 3774 | 6 |
| 203.976624 | 31.74 | 58.89 | 42.40 | 88.49 | 2977 | 6 |
| 204.012238 | 37.31 | 36.28 | 23.70 | 62.87 | 1374 | 6 |
| 204.056717 | 30.38 | 57.80 | 39.75 | 86.31 | 4227 | 6 |
| 204.129074 | 30.49 | 50.53 | 33.37 | 76.48 | 4042 | 9 |
| 204.199524 | 28.91 | 43.11 | 35.39 | 70.78 | 4164 | 9 |
| 204.269257 | 27.46 | 42.10 | 22.52 | 61.00 | 4302 | 9 |
| 204.339310 | 19.15 | 44.83 | 20.04 | 59.20 | 4382 | 9 |
| 204.409821 | 15.80 | 49.32 | 28.12 | 65.71 | 4407 | 18 |
| 204.480484 | 17.14 | 47.84 | 30.64 | 68.93 | 4291 | 18 |
| 204.552612 | 21.20 | 60.14 | 33.51 | 82.87 | 4370 | 9 |
| 204.623901 | 24.46 | 64.57 | 34.78 | 86.53 | 4238 | 9 |
| 204.693848 | 20.14 | 68.52 | 32.73 | 88.51 | 3914 | 22 |
| 204.763702 | 24.61 | 69.41 | 30.25 | 90.08 | 4225 | 15 |
| 204.834717 | 20.28 | 61.47 | 22.11 | 76.37 | 4289 | 15 |
| 204.906494 | 26.78 | 54.40 | 24.03 | 72.57 | 4516 | 7 |
| 204.969604 | 32.14 | 58.31 | 27.78 | 80.57 | 3519 | 7 |
| 205.005569 | 35.56 | 52.68 | 19.75 | 68.37 | 950 | 7 |
| 205.047012 | 32.54 | 57.19 | 33.38 | 82.34 | 4238 | 7 |
| 205.119446 | 29.88 | 51.01 | 35.89 | 76.29 | 4035 | 7 |
| 205.189957 | 29.49 | 44.54 | 29.40 | 66.31 | 4143 | 9 |
| 205.259766 | 31.55 | 38.28 | 16.26 | 57.89 | 4297 | 5 |
| 205.329697 | 22.53 | 37.55 | 15.48 | 51.83 | 4367 | 5 |
| 205.400238 | 17.38 | 33.57 | 15.66 | 45.36 | 4419 | 6 |
| 205.470795 | 17.86 | 32.65 | 21.53 | 48.27 | 4304 | 6 |
| 205.542831 | 21.55 | 45.24 | 28.34 | 64.09 | 4380 | 22 |
| 205.614212 | 23.61 | 55.53 | 30.60 | 75.63 | 4252 | 22 |
| 205.684555 | 18.92 | 58.33 | 27.90 | 76.49 | 4000 | 39 |
| 205.754044 | 23.71 | 73.68 | 40.65 | 96.62 | 4221 | 80 |
| 205.825012 | 24.09 | 77.89 | 33.73 | 100.95 | 4277 | 80 |
| 205.896805 | 30.81 | 76.24 | 32.71 | 100.12 | 4514 | 18 |
| 205.966568 | 37.40 | 71.12 | 33.51 | 97.57 | 4382 | 18 |
| 206.000702 | 39.76 | 124.42 | 33.79 | 135.00 | 117 | 9 |
| 206.037216 | 33.01 | 73.77 | 37.72 | 100.28 | 4260 | 9 |
| 206.109741 | 33.81 | 56.41 | 37.41 | 84.34 | 4024 | 9 |
| 206.180374 | 29.74 | 49.47 | 37.79 | 77.38 | 4123 | 9 |
| 206.250244 | 33.62 | 43.89 | 27.35 | 67.22 | 4271 | 5 |
| 206.320099 | 25.75 | 42.03 | 18.30 | 59.23 | 4341 | 5 |
| 206.390579 | 19.63 | 38.17 | 24.51 | 56.81 | 4420 | 2 |
| 206.461182 | 17.73 | 38.92 | 27.15 | 58.13 | 4327 | 2 |
| 206.532959 | 21.45 | 49.43 | 28.06 | 69.21 | 4377 | 3 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 206.604523 | 20.64 | 53.78 | 22.03 | 67.07 | 4278 | 3 |
| 206.675125 | 16.85 | 49.12 | 20.83 | 60.44 | 4073 | 2 |
| 206.744476 | 25.80 | 52.94 | 28.21 | 71.98 | 4190 | 2 |
| 206.815277 | 26.18 | 49.49 | 31.27 | 73.08 | 4290 | 2 |
| 206.887146 | 30.25 | 49.49 | 31.79 | 74.76 | 4512 | 6 |
| 206.958649 | 36.52 | 48.09 | 25.46 | 72.91 | 4631 | 6 |
| 206.996521 | 18.15 | 39.28 | 18.60 | 50.90 | 591 | 6 |
| 207.033569 | 37.19 | 54.45 | 29.80 | 80.35 | 3628 | 5 |
| 207.098999 | 31.23 | 49.75 | 33.74 | 75.77 | 4014 | 5 |
| 207.169785 | 27.74 | 47.01 | 31.97 | 70.24 | 4108 | 5 |
| 207.239777 | 28.66 | 38.14 | 20.48 | 57.08 | 4233 | 5 |
| 207.309723 | 24.90 | 36.19 | 16.70 | 53.03 | 4385 | 3 |
| 207.380035 | 19.34 | 34.01 | 19.69 | 49.44 | 4429 | 4 |
| 207.450653 | 15.76 | 34.60 | 21.31 | 48.27 | 4313 | 4 |
| 207.522156 | 19.58 | 43.10 | 22.45 | 57.62 | 4379 | 6 |
| 207.593796 | 21.83 | 51.26 | 20.41 | 64.20 | 4309 | 6 |
| 207.664566 | 17.82 | 48.40 | 17.14 | 57.68 | 4104 | 7 |
| 207.733887 | 22.09 | 50.48 | 26.43 | 67.10 | 4148 | 7 |
| 207.804657 | 27.30 | 45.80 | 25.86 | 67.17 | 4271 | 5 |
| 207.876450 | 29.42 | 45.77 | 29.15 | 69.72 | 4469 | 7 |
| 207.947998 | 31.85 | 43.64 | 21.91 | 66.45 | 4624 | 7 |
| 207.989273 | 35.25 | 84.42 | 20.89 | 97.52 | 949 | 7 |
| 208.026337 | 30.08 | 44.35 | 28.54 | 69.72 | 3427 | 7 |
| 208.089279 | 28.29 | 47.03 | 28.91 | 69.86 | 4032 | 7 |
| 208.160172 | 24.71 | 46.31 | 28.34 | 67.09 | 4086 | 9 |
| 208.230270 | 25.83 | 39.52 | 23.85 | 58.84 | 4224 | 9 |
| 208.300140 | 22.23 | 57.25 | 42.69 | 81.27 | 4362 | 18 |
| 208.368881 | 19.02 | 47.21 | 33.97 | 69.37 | 4143 | 18 |
| 208.441269 | 19.04 | 43.52 | 28.87 | 62.74 | 3749 | 12 |
| 208.512177 | 21.90 | 46.73 | 28.96 | 66.17 | 4343 | 22 |
| 208.584045 | 23.28 | 54.72 | 43.64 | 82.64 | 4324 | 22 |
| 208.654938 | 21.02 | 54.38 | 23.91 | 68.96 | 4131 | 12 |
| 208.724243 | 17.95 | 59.27 | 28.04 | 76.14 | 4127 | 12 |
| 208.794937 | 23.98 | 60.47 | 29.51 | 78.74 | 4259 | 32 |
| 208.866394 | 29.68 | 59.18 | 28.29 | 80.51 | 4487 | 32 |
| 208.938248 | 36.34 | 50.23 | 46.22 | 89.81 | 4610 | 39 |
| 208.986160 | 32.23 | 72.29 | 49.85 | 109.03 | 1570 | 39 |
| 209.021042 | 43.92 | 56.84 | 48.19 | 98.87 | 2844 | 22 |
| 209.078827 | 36.45 | 64.98 | 51.64 | 103.39 | 4153 | 22 |
| 209.150558 | 32.28 | 51.24 | 42.50 | 82.65 | 4085 | 7 |
| 209.220688 | 33.01 | 39.10 | 43.70 | 75.99 | 4197 | 7 |
| 209.290497 | 32.52 | 40.99 | 45.24 | 76.01 | 4336 | 3 |
| 209.360764 | 24.66 | 36.38 | 46.26 | 71.39 | 4424 | 3 |
| 209.431366 | 19.98 | 38.17 | 46.08 | 71.09 | 4367 | 2 |
| 209.501984 | 21.34 | 42.88 | 45.40 | 74.28 | 4260 | 3 |
| 209.574341 | 22.80 | 50.70 | 43.39 | 79.24 | 4352 | 3 |
| 209.645355 | 20.95 | 47.20 | 48.15 | 78.54 | 4156 | 4 |
| 209.791824 | 27.88 | 49.62 | 51.58 | 86.06 | 3495 | 6 |
| 209.856583 | 29.03 | 45.52 | 48.88 | 82.95 | 4396 | 6 |
| 209.928268 | 33.84 | 48.50 | 42.12 | 84.20 | 4566 | 9 |
| 209.982864 | 29.17 | 59.13 | 49.06 | 92.02 | 2412 | 9 |
| 210.017914 | 36.22 | 39.30 | 19.22 | 62.92 | 2034 | 12 |
| 210.068863 | 30.36 | 54.94 | 34.54 | 81.11 | 4201 | 12 |
| 210.140961 | 23.79 | 51.58 | 32.07 | 72.65 | 4046 | 15 |
| 210.211151 | 24.35 | 49.86 | 38.77 | 76.01 | 4188 | 15 |
| 210.281082 | 25.81 | 55.80 | 38.11 | 81.05 | 4270 | 39 |
| 210.351105 | 23.57 | 39.29 | 36.93 | 70.18 | 4401 | 39 |
| 210.421692 | 20.22 | 34.41 | 25.76 | 54.86 | 4386 | 32 |
| 210.492325 | 22.60 | 33.51 | 22.93 | 53.61 | 4278 | 32 |
| 210.564590 | 36.18 | 44.48 | 23.94 | 70.55 | 4361 | 67 |
| 210.635651 | 41.20 | 60.15 | 29.24 | 90.56 | 4191 | 67 |
| 210.705368 | 48.77 | 68.95 | 37.30 | 106.89 | 3940 | 67 |
| 210.775604 | 48.17 | 64.57 | 29.72 | 99.66 | 4235 | 18 |
| 210.846558 | 34.71 | 52.29 | 25.96 | 78.42 | 4294 | 18 |
| 210.918427 | 38.16 | 52.73 | 26.19 | 80.62 | 4528 | 6 |
| 210.976608 | 41.46 | 70.45 | 21.29 | 93.59 | 2914 | 6 |
| 211.012970 | 46.82 | 41.08 | 14.93 | 70.55 | 1548 | 27 |
| 211.059006 | 38.92 | 75.16 | 38.65 | 104.94 | 4225 | 27 |
| 211.131317 | 31.81 | 55.71 | 29.98 | 82.49 | 4041 | 22 |
| 211.201706 | 29.90 | 57.97 | 45.81 | 88.02 | 4169 | 22 |
| 211.271439 | 31.25 | 62.78 | 43.27 | 92.40 | 4307 | 22 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 211.341492 | 31.44 | 42.84 | 30.88 | 73.34 | 4393 | 22 |
| 211.412018 | 31.19 | 63.54 | 57.36 | 100.25 | 4399 | 67 |
| 211.482712 | 32.76 | 53.60 | 56.83 | 93.50 | 4294 | 67 |
| 211.554840 | 40.02 | 55.80 | 21.56 | 79.62 | 4374 | 39 |
| 211.626038 | 45.38 | 50.02 | 19.90 | 79.25 | 4224 | 18 |
| 211.696060 | 40.76 | 52.87 | 18.73 | 77.76 | 3917 | 18 |
| 211.765915 | 42.38 | 55.46 | 25.32 | 86.40 | 4230 | 9 |
| 211.836868 | 30.92 | 60.78 | 19.98 | 78.70 | 4284 | 9 |
| 211.908661 | 38.79 | 56.71 | 31.05 | 87.14 | 4516 | 12 |
| 211.970261 | 48.69 | 58.97 | 25.09 | 91.48 | 3346 | 12 |
| 212.006256 | 24.42 | 37.16 | 15.49 | 48.60 | 1069 | 12 |
| 212.048248 | 35.88 | 60.97 | 27.22 | 82.49 | 4243 | 12 |
| 212.120575 | 29.24 | 59.82 | 42.70 | 87.99 | 4033 | 12 |
| 212.191116 | 28.26 | 46.61 | 36.68 | 74.18 | 4149 | 15 |
| 212.260956 | 25.24 | 35.63 | 20.51 | 53.89 | 4301 | 4 |
| 212.330948 | 22.05 | 33.46 | 20.47 | 50.50 | 4363 | 4 |
| 212.401428 | 17.50 | 31.20 | 18.08 | 44.47 | 4420 | 5 |
| 212.471985 | 18.59 | 30.14 | 23.19 | 47.24 | 4294 | 5 |
| 212.544067 | 26.88 | 42.42 | 20.34 | 58.65 | 4376 | 9 |
| 212.615387 | 30.74 | 46.96 | 21.59 | 66.19 | 4254 | 9 |
| 212.685577 | 30.79 | 44.94 | 15.60 | 62.04 | 3969 | 6 |
| 212.755295 | 29.82 | 44.24 | 27.00 | 69.93 | 4218 | 7 |
| 212.826218 | 25.42 | 51.82 | 20.93 | 68.22 | 4275 | 7 |
| 212.897995 | 30.35 | 50.51 | 30.62 | 75.01 | 4518 | 7 |
| 212.966919 | 36.53 | 46.07 | 25.08 | 72.34 | 4245 | 7 |
| 213.001404 | 39.95 | 56.88 | 29.48 | 75.69 | 235 | 5 |
| 213.038422 | 34.51 | 50.68 | 25.26 | 73.21 | 4255 | 5 |
| 213.110901 | 31.92 | 50.63 | 34.97 | 76.22 | 4032 | 5 |
| 213.181549 | 24.36 | 48.18 | 38.70 | 72.12 | 4125 | 7 |
| 213.251450 | 25.57 | 36.62 | 24.78 | 56.68 | 4272 | 18 |
| 213.321335 | 21.84 | 36.89 | 18.31 | 52.20 | 4364 | 18 |
| 213.391830 | 16.70 | 37.45 | 33.70 | 60.64 | 4421 | 7 |
| 213.462387 | 19.99 | 35.02 | 26.25 | 56.19 | 4329 | 7 |
| 213.534241 | 25.50 | 45.64 | 27.57 | 65.44 | 4379 | 12 |
| 213.605713 | 28.26 | 50.71 | 22.90 | 68.86 | 4273 | 12 |
| 213.676239 | 29.30 | 48.46 | 22.43 | 67.19 | 4057 | 15 |
| 213.745682 | 35.13 | 55.46 | 35.31 | 82.76 | 4187 | 15 |
| 213.816559 | 30.38 | 59.72 | 40.97 | 87.83 | 4263 | 56 |
| 213.888351 | 31.72 | 49.76 | 38.30 | 78.29 | 4511 | 48 |
| 213.959869 | 34.96 | 60.24 | 38.53 | 91.25 | 4625 | 48 |
| 213.997208 | 23.81 | 41.66 | 12.78 | 54.25 | 473 | 48 |
| 214.034103 | 32.31 | 49.51 | 31.98 | 78.98 | 3789 | 9 |
| 214.101242 | 30.96 | 52.73 | 31.37 | 76.77 | 3996 | 9 |
| 214.171997 | 26.28 | 48.33 | 34.49 | 70.04 | 4103 | 7 |
| 214.241562 | 25.50 | 40.26 | 24.41 | 58.99 | 4184 | 7 |
| 214.311844 | 24.18 | 35.08 | 17.37 | 51.68 | 4370 | 6 |
| 214.382187 | 17.35 | 33.94 | 18.48 | 47.54 | 4420 | 9 |
| 214.452835 | 17.62 | 31.02 | 23.17 | 47.82 | 4317 | 9 |
| 214.524414 | 21.50 | 39.28 | 27.62 | 57.45 | 4364 | 7 |
| 214.595978 | 26.31 | 47.19 | 26.00 | 65.65 | 4307 | 7 |
| 214.666733 | 26.31 | 51.25 | 22.35 | 69.50 | 4089 | 22 |
| 214.736069 | 29.86 | 59.55 | 30.38 | 83.56 | 4154 | 22 |
| 214.806870 | 24.51 | 59.06 | 28.31 | 78.22 | 4268 | 15 |
| 214.878632 | 22.53 | 50.29 | 37.78 | 76.46 | 4474 | 18 |
| 214.950241 | 31.36 | 57.19 | 40.63 | 89.01 | 4615 | 18 |
| 214.991287 | 30.69 | 87.61 | 28.93 | 106.10 | 929 | 18 |
| 215.028290 | 34.18 | 48.82 | 30.39 | 78.40 | 3438 | 18 |
| 215.091507 | 31.86 | 53.60 | 28.33 | 76.16 | 4019 | 18 |
| 215.162369 | 26.54 | 55.93 | 50.08 | 87.14 | 4095 | 15 |
| 215.232437 | 26.99 | 40.57 | 30.03 | 65.96 | 4230 | 15 |
| 215.302277 | 23.37 | 36.51 | 18.04 | 52.05 | 4359 | 7 |
| 215.372620 | 16.19 | 32.98 | 17.45 | 46.24 | 4429 | 7 |
| 215.443222 | 16.19 | 30.24 | 22.02 | 45.53 | 4346 | 6 |
| 215.514404 | 19.36 | 36.14 | 25.76 | 53.52 | 4338 | 5 |
| 215.586258 | 24.79 | 47.70 | 16.75 | 61.04 | 4325 | 5 |
| 215.657135 | 21.91 | 46.23 | 18.29 | 59.28 | 4121 | 9 |
| 215.726486 | 26.15 | 48.40 | 27.49 | 70.67 | 4126 | 9 |
| 215.797150 | 26.09 | 55.35 | 25.21 | 75.25 | 4271 | 15 |
| 215.868668 | 22.17 | 55.25 | 26.54 | 73.03 | 4474 | 15 |
| 215.940445 | 27.49 | 47.94 | 30.87 | 73.36 | 4603 | 9 |
| 215.986801 | 20.84 | 55.32 | 38.78 | 79.25 | 1393 | 9 |

| | | | | | | |
|------------|--------|-------|-------|--------|------|----|
| 216.021469 | 37.19 | 48.82 | 32.32 | 78.60 | 2964 | 9 |
| 216.080185 | 30.54 | 50.44 | 28.32 | 72.89 | 4129 | 9 |
| 216.151794 | 24.10 | 48.97 | 33.27 | 70.71 | 4080 | 9 |
| 216.221924 | 22.60 | 37.56 | 25.58 | 56.84 | 4205 | 9 |
| 216.291733 | 21.79 | 33.20 | 16.38 | 47.23 | 4337 | 7 |
| 216.361984 | 16.23 | 30.41 | 18.16 | 44.08 | 4422 | 7 |
| 216.432587 | 14.82 | 31.20 | 23.01 | 46.66 | 4356 | 9 |
| 216.503250 | 17.63 | 33.14 | 23.57 | 49.32 | 4265 | 7 |
| 216.575562 | 25.07 | 43.39 | 18.01 | 59.72 | 4345 | 7 |
| 216.646545 | 24.26 | 45.76 | 18.46 | 59.71 | 4152 | 12 |
| 216.715881 | 25.01 | 46.38 | 24.28 | 65.78 | 4067 | 12 |
| 216.786514 | 26.62 | 47.85 | 24.05 | 67.94 | 4255 | 12 |
| 216.857910 | 20.01 | 50.48 | 24.21 | 66.11 | 4402 | 12 |
| 216.929703 | 27.47 | 48.76 | 24.63 | 68.57 | 4598 | 7 |
| 216.983292 | 22.94 | 49.22 | 37.80 | 76.62 | 2281 | 7 |
| 217.018143 | 39.15 | 50.19 | 21.31 | 72.50 | 2151 | 18 |
| 217.070190 | 26.07 | 57.07 | 36.06 | 82.18 | 4184 | 18 |
| 217.142136 | 21.41 | 54.15 | 40.31 | 80.42 | 4066 | 15 |
| 217.212372 | 24.43 | 45.51 | 30.06 | 67.76 | 4189 | 15 |
| 217.282227 | 23.79 | 41.33 | 24.87 | 60.73 | 4312 | 18 |
| 217.352371 | 20.03 | 33.31 | 24.29 | 53.43 | 4407 | 18 |
| 217.422882 | 19.49 | 36.46 | 21.76 | 51.59 | 4382 | 18 |
| 217.493652 | 22.47 | 38.82 | 21.88 | 56.00 | 4256 | 18 |
| 217.565826 | 33.09 | 50.98 | 28.27 | 76.32 | 4358 | 15 |
| 217.636902 | 30.86 | 51.44 | 23.02 | 72.08 | 4189 | 22 |
| 217.706543 | 30.78 | 58.23 | 25.54 | 78.26 | 4018 | 22 |
| 217.776810 | 32.62 | 65.22 | 31.98 | 90.71 | 4249 | 18 |
| 217.847900 | 23.13 | 49.82 | 24.52 | 68.34 | 4299 | 18 |
| 217.919693 | 28.15 | 50.61 | 29.33 | 74.62 | 4527 | 12 |
| 217.978149 | 26.56 | 65.48 | 34.85 | 88.99 | 2954 | 12 |
| 218.014587 | 42.99 | 31.00 | 23.42 | 62.73 | 1514 | 9 |
| 218.060287 | 27.78 | 53.77 | 27.05 | 75.52 | 4203 | 9 |
| 218.132507 | 21.43 | 47.39 | 27.30 | 66.58 | 4041 | 15 |
| 218.203033 | 134.28 | 63.90 | 68.68 | 182.44 | 4123 | 15 |
| 218.272690 | 21.34 | 40.57 | 22.77 | 56.73 | 4320 | 48 |
| 218.342743 | 20.46 | 44.39 | 26.65 | 62.25 | 4390 | 48 |
| 218.413284 | 15.60 | 36.19 | 24.97 | 52.73 | 4396 | 39 |
| 218.483917 | 15.76 | 41.07 | 26.82 | 56.17 | 4290 | 39 |
| 218.556076 | 24.10 | 53.86 | 25.10 | 71.55 | 4375 | 18 |
| 218.627243 | 24.55 | 53.59 | 25.67 | 72.53 | 4213 | 27 |
| 218.697250 | 22.00 | 50.29 | 27.69 | 68.96 | 3915 | 27 |
| 218.767151 | 23.50 | 59.91 | 23.92 | 77.04 | 4237 | 15 |
| 218.838165 | 17.62 | 55.39 | 27.65 | 71.56 | 4285 | 15 |
| 218.909943 | 26.68 | 48.47 | 34.79 | 75.87 | 4517 | 27 |
| 218.970642 | 36.83 | 69.88 | 43.03 | 101.73 | 3250 | 27 |
| 219.007462 | 34.50 | 33.27 | 54.11 | 81.73 | 1222 | 27 |
| 219.050522 | 29.11 | 63.82 | 40.14 | 91.83 | 4241 | 27 |
| 219.122849 | 27.22 | 60.02 | 45.96 | 90.24 | 4021 | 27 |
| 219.193573 | 25.34 | 57.44 | 44.65 | 85.82 | 3990 | 32 |
| 219.263153 | 30.60 | 38.03 | 27.12 | 62.54 | 4303 | 9 |
| 219.333069 | 21.19 | 41.62 | 17.18 | 55.53 | 4359 | 9 |
| 219.403687 | 16.16 | 34.56 | 22.11 | 48.74 | 4413 | 9 |
| 219.474243 | 17.17 | 35.90 | 24.87 | 52.01 | 4295 | 9 |
| 219.546310 | 22.63 | 46.60 | 22.58 | 61.50 | 4381 | 15 |
| 219.617599 | 23.70 | 52.33 | 24.06 | 68.32 | 4236 | 15 |
| 219.687866 | 18.60 | 47.13 | 18.74 | 59.25 | 3962 | 12 |
| 219.757462 | 22.27 | 55.25 | 24.64 | 71.49 | 4227 | 9 |
| 219.828445 | 20.30 | 51.97 | 24.43 | 66.66 | 4281 | 9 |
| 219.900192 | 25.96 | 53.20 | 33.79 | 76.82 | 4518 | 18 |
| 219.967743 | 29.49 | 48.95 | 29.83 | 72.30 | 4081 | 18 |
| 220.002441 | 45.83 | 59.55 | 21.91 | 78.99 | 414 | 5 |
| 220.040680 | 30.39 | 49.91 | 26.43 | 71.39 | 4255 | 5 |
| 220.113174 | 29.41 | 46.49 | 30.45 | 71.07 | 4033 | 5 |
| 220.183762 | 25.84 | 41.79 | 28.46 | 63.71 | 4108 | 4 |
| 220.253662 | 27.95 | 38.16 | 22.52 | 57.67 | 4271 | 6 |
| 220.323486 | 20.63 | 37.67 | 19.04 | 52.78 | 4350 | 6 |
| 220.394028 | 16.38 | 34.50 | 23.90 | 50.25 | 4430 | 12 |
| 220.464813 | 16.16 | 41.24 | 32.80 | 60.74 | 4231 | 12 |
| 220.536484 | 21.38 | 40.45 | 25.53 | 59.45 | 4382 | 12 |
| 220.607956 | 22.38 | 49.22 | 17.96 | 61.55 | 4270 | 12 |
| 220.678467 | 18.03 | 46.11 | 16.54 | 56.03 | 4044 | 5 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|-----|
| 220.747894 | 19.48 | 50.68 | 29.20 | 68.82 | 4188 | 5 |
| 220.818756 | 21.65 | 46.99 | 24.68 | 63.79 | 4272 | 7 |
| 220.890503 | 27.69 | 44.79 | 26.84 | 66.24 | 4522 | 7 |
| 220.962112 | 34.78 | 44.42 | 25.94 | 69.39 | 4631 | 7 |
| 220.998245 | 22.91 | 41.16 | 11.88 | 51.26 | 294 | 7 |
| 221.034256 | 34.70 | 50.20 | 27.77 | 76.39 | 3872 | 6 |
| 221.102402 | 36.26 | 45.24 | 29.06 | 73.26 | 4025 | 6 |
| 221.173187 | 28.19 | 43.43 | 29.63 | 67.23 | 4113 | 5 |
| 221.243195 | 31.21 | 36.84 | 24.67 | 59.74 | 4252 | 5 |
| 221.313126 | 26.07 | 38.99 | 17.07 | 55.78 | 4393 | 7 |
| 221.383438 | 20.50 | 31.82 | 23.16 | 49.79 | 4431 | 5 |
| 221.454071 | 18.00 | 33.15 | 20.83 | 47.42 | 4318 | 5 |
| 221.525696 | 23.01 | 43.03 | 25.28 | 61.00 | 4359 | 9 |
| 221.597244 | 22.85 | 47.52 | 18.59 | 60.07 | 4302 | 9 |
| 221.668045 | 20.10 | 45.19 | 19.64 | 58.22 | 4082 | 6 |
| 221.737320 | 17.40 | 43.02 | 25.37 | 58.40 | 4151 | 6 |
| 221.808075 | 20.61 | 52.05 | 26.29 | 68.54 | 4266 | 7 |
| 221.879929 | 24.04 | 45.99 | 28.33 | 65.22 | 4481 | 7 |
| 221.951447 | 32.10 | 44.82 | 27.35 | 67.89 | 4621 | 7 |
| 221.991318 | 24.28 | 52.33 | 33.30 | 70.53 | 805 | 7 |
| 222.028687 | 36.41 | 49.98 | 32.23 | 79.50 | 3541 | 6 |
| 222.092773 | 32.44 | 46.79 | 29.86 | 72.48 | 4028 | 6 |
| 222.163589 | 29.18 | 45.65 | 27.39 | 67.27 | 4078 | 6 |
| 222.233658 | 30.45 | 36.86 | 21.81 | 58.33 | 4228 | 6 |
| 222.303513 | 28.11 | 36.54 | 15.44 | 54.08 | 4369 | 4 |
| 222.373856 | 20.07 | 31.90 | 21.65 | 49.15 | 4432 | 4 |
| 222.444473 | 17.61 | 33.76 | 24.94 | 50.21 | 4342 | 4 |
| 222.515793 | 20.25 | 38.74 | 24.21 | 56.09 | 4350 | 4 |
| 222.587540 | 23.53 | 45.66 | 18.18 | 59.75 | 4325 | 4 |
| 222.658417 | 20.38 | 43.89 | 16.28 | 55.52 | 4108 | 4 |
| 222.727768 | 18.89 | 41.39 | 27.76 | 58.72 | 4126 | 4 |
| 222.798431 | 19.56 | 46.53 | 25.64 | 61.92 | 4259 | 4 |
| 222.869843 | 22.02 | 48.84 | 25.56 | 65.50 | 4506 | 4 |
| 222.941696 | 28.03 | 52.59 | 25.07 | 70.77 | 4613 | 9 |
| 222.986801 | 28.68 | 46.55 | 50.29 | 81.04 | 1266 | 9 |
| 223.022354 | 31.71 | 41.78 | 18.19 | 62.92 | 3127 | 4 |
| 223.082626 | 32.42 | 44.85 | 30.60 | 72.50 | 4099 | 4 |
| 223.224136 | 26.97 | 41.47 | 31.74 | 65.35 | 4204 | 12 |
| 223.294098 | 26.45 | 54.97 | 34.93 | 77.57 | 4271 | 39 |
| 223.364197 | 19.24 | 35.66 | 23.33 | 54.41 | 4423 | 39 |
| 223.434799 | 16.13 | 35.81 | 24.05 | 53.48 | 4362 | 27 |
| 223.505600 | 18.14 | 43.59 | 30.56 | 62.82 | 4260 | 32 |
| 223.577820 | 23.84 | 49.60 | 21.91 | 65.50 | 4344 | 32 |
| 223.648743 | 21.54 | 48.78 | 19.32 | 61.50 | 4134 | 15 |
| 223.718140 | 19.38 | 55.39 | 24.90 | 69.65 | 4076 | 15 |
| 223.788742 | 20.58 | 58.32 | 25.91 | 74.84 | 4259 | 18 |
| 223.860138 | 19.84 | 57.80 | 31.17 | 76.36 | 4423 | 18 |
| 223.931824 | 32.16 | 77.75 | 47.92 | 114.59 | 4577 | 56 |
| 223.984192 | 33.25 | 94.32 | 72.78 | 142.01 | 2103 | 56 |
| 224.018890 | 33.33 | 62.37 | 55.55 | 106.03 | 2322 | 67 |
| 224.072418 | 29.57 | 90.70 | 51.90 | 121.82 | 4180 | 67 |
| 224.144394 | 28.82 | 84.44 | 57.41 | 120.13 | 4068 | 67 |
| 224.214600 | 34.30 | 100.87 | 75.64 | 142.81 | 4193 | 67 |
| 224.284393 | 35.34 | 81.72 | 54.67 | 118.99 | 4328 | 48 |
| 224.354507 | 23.79 | 69.06 | 41.37 | 95.31 | 4407 | 48 |
| 224.425110 | 17.04 | 58.03 | 36.05 | 79.21 | 4381 | 32 |
| 224.495834 | 19.13 | 66.89 | 42.35 | 90.37 | 4264 | 32 |
| 224.568069 | 26.31 | 70.17 | 30.25 | 92.60 | 4358 | 32 |
| 224.639160 | 23.91 | 61.72 | 26.30 | 81.50 | 4190 | 12 |
| 224.708801 | 21.19 | 67.97 | 23.20 | 83.27 | 4021 | 12 |
| 224.779099 | 27.78 | 77.25 | 32.27 | 96.83 | 4244 | 48 |
| 224.850174 | 20.91 | 80.81 | 32.34 | 101.09 | 4312 | 48 |
| 224.922089 | 30.08 | 79.89 | 44.00 | 109.09 | 4557 | 67 |
| 224.980270 | 22.12 | 76.54 | 38.16 | 96.57 | 2940 | 67 |
| 225.016525 | 45.12 | 52.36 | 22.07 | 77.56 | 1537 | 48 |
| 225.062592 | 25.92 | 51.31 | 34.69 | 77.09 | 4208 | 48 |
| 225.134796 | 28.84 | 100.88 | 105.75 | 162.19 | 4034 | 154 |
| 225.205109 | 26.63 | 62.71 | 59.72 | 100.49 | 4167 | 154 |
| 225.274841 | 40.13 | 157.92 | 119.78 | 222.26 | 4315 | 179 |
| 225.344955 | 47.90 | 201.22 | 142.20 | 272.21 | 4383 | 179 |
| 225.415588 | 44.68 | 171.32 | 103.94 | 221.31 | 4368 | 179 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|-----|
| 225.486191 | 34.59 | 143.68 | 77.72 | 183.75 | 4283 | 179 |
| 225.558350 | 42.99 | 125.80 | 66.32 | 175.46 | 4379 | 154 |
| 225.629532 | 38.15 | 125.09 | 89.28 | 190.29 | 4216 | 154 |
| 225.699554 | 36.18 | 141.37 | 42.24 | 166.44 | 3918 | 154 |
| 225.769409 | 38.32 | 129.68 | 50.74 | 158.50 | 4231 | 94 |
| 225.840439 | 25.05 | 119.41 | 33.21 | 135.34 | 4276 | 94 |
| 225.912170 | 40.40 | 98.44 | 35.24 | 126.30 | 4517 | 22 |
| 225.972519 | 48.12 | 91.51 | 44.92 | 133.62 | 3203 | 22 |
| 226.008926 | 33.75 | 61.85 | 22.59 | 77.79 | 1205 | 32 |
| 226.051758 | 38.96 | 71.72 | 32.32 | 97.99 | 4242 | 32 |
| 226.124069 | 41.13 | 64.77 | 27.63 | 88.02 | 4030 | 32 |
| 226.194580 | 34.90 | 42.24 | 28.39 | 68.72 | 4155 | 67 |
| 226.264404 | 37.50 | 46.76 | 28.16 | 72.33 | 4306 | 15 |
| 226.334381 | 27.97 | 49.62 | 22.61 | 68.00 | 4378 | 15 |
| 226.404938 | 24.47 | 48.93 | 26.53 | 66.91 | 4404 | 6 |
| 226.475525 | 22.06 | 51.80 | 27.67 | 68.19 | 4305 | 6 |
| 226.547577 | 24.98 | 60.53 | 22.87 | 75.33 | 4377 | 9 |
| 226.618896 | 23.51 | 59.84 | 17.35 | 72.58 | 4250 | 9 |
| 226.688950 | 22.80 | 53.39 | 15.86 | 66.19 | 3946 | 6 |
| 226.758774 | 26.97 | 49.26 | 25.36 | 71.96 | 4222 | 6 |
| 226.829712 | 29.82 | 47.23 | 26.36 | 73.36 | 4281 | 6 |
| 226.901459 | 39.78 | 48.03 | 28.15 | 78.92 | 4519 | 12 |
| 226.968094 | 43.41 | 48.23 | 20.11 | 75.94 | 3949 | 12 |
| 227.003143 | 53.15 | 73.72 | 38.62 | 101.24 | 531 | 3 |
| 227.041962 | 42.98 | 55.70 | 39.28 | 91.77 | 4254 | 3 |
| 227.114349 | 41.38 | 54.62 | 42.46 | 90.95 | 4014 | 3 |
| 227.255051 | 38.09 | 41.74 | 46.09 | 82.38 | 4254 | 3 |
| 227.324768 | 31.84 | 42.26 | 45.41 | 78.11 | 4341 | 3 |
| 227.395370 | 25.98 | 40.29 | 47.44 | 75.68 | 4422 | 4 |
| 227.465820 | 21.97 | 41.40 | 48.10 | 75.32 | 4322 | 4 |
| 227.537796 | 25.51 | 50.20 | 46.98 | 83.59 | 4374 | 9 |
| 227.609177 | 24.45 | 52.54 | 44.36 | 84.05 | 4275 | 9 |
| 227.679764 | 22.59 | 47.75 | 44.89 | 79.44 | 4050 | 18 |
| 227.749191 | 18.51 | 48.13 | 49.56 | 82.71 | 4191 | 18 |
| 227.820053 | 25.74 | 55.11 | 50.37 | 89.28 | 4261 | 22 |
| 227.891815 | 34.19 | 43.75 | 51.43 | 88.11 | 4512 | 32 |
| 227.962799 | 41.35 | 53.41 | 47.44 | 94.62 | 4532 | 32 |
| 227.998978 | 26.02 | 77.77 | 24.60 | 87.37 | 115 | 32 |
| 228.033813 | 43.78 | 47.33 | 26.76 | 77.05 | 3737 | 15 |
| 228.105743 | 44.14 | 48.98 | 30.94 | 80.99 | 3148 | 15 |
| 228.175400 | 45.73 | 52.81 | 31.73 | 84.65 | 4105 | 22 |
| 228.245377 | 48.55 | 43.25 | 25.84 | 75.95 | 4252 | 22 |
| 228.315262 | 40.84 | 42.90 | 16.00 | 66.66 | 4378 | 4 |
| 228.385696 | 36.64 | 40.29 | 24.16 | 66.08 | 4438 | 6 |
| 228.456253 | 31.26 | 35.44 | 29.72 | 64.82 | 4328 | 6 |
| 228.527969 | 34.35 | 46.73 | 27.13 | 71.29 | 4375 | 5 |
| 228.599472 | 31.37 | 54.76 | 18.26 | 72.47 | 4299 | 5 |
| 228.670181 | 34.85 | 50.59 | 17.66 | 69.75 | 4084 | 5 |
| 228.739487 | 26.29 | 42.58 | 26.60 | 63.36 | 4167 | 5 |
| 228.810318 | 29.91 | 45.28 | 24.03 | 65.47 | 4262 | 6 |
| 228.882202 | 40.61 | 43.64 | 29.02 | 73.82 | 4487 | 5 |
| 228.953644 | 47.93 | 46.67 | 27.65 | 79.91 | 4626 | 5 |
| 228.992203 | 31.00 | 39.03 | 24.36 | 61.29 | 687 | 5 |
| 229.029877 | 56.18 | 54.31 | 34.47 | 93.30 | 3659 | 7 |
| 229.095032 | 54.37 | 53.98 | 35.72 | 93.64 | 4029 | 7 |
| 229.165878 | 43.03 | 49.55 | 29.36 | 78.99 | 4088 | 7 |
| 229.235886 | 45.92 | 43.36 | 23.42 | 74.12 | 4225 | 7 |
| 229.305725 | 42.23 | 39.67 | 16.20 | 67.35 | 4365 | 9 |
| 229.376007 | 34.11 | 36.61 | 23.21 | 62.05 | 4424 | 5 |
| 229.446671 | 31.33 | 37.99 | 23.99 | 62.57 | 4345 | 5 |
| 229.518097 | 32.15 | 49.58 | 27.05 | 72.87 | 4346 | 7 |
| 229.589752 | 28.75 | 51.21 | 22.39 | 69.46 | 4322 | 7 |
| 229.660629 | 33.84 | 49.52 | 16.17 | 68.54 | 4117 | 5 |
| 229.729935 | 24.60 | 42.30 | 22.19 | 59.60 | 4136 | 5 |
| 229.800613 | 26.97 | 46.48 | 26.35 | 65.56 | 4268 | 6 |
| 229.872177 | 34.94 | 42.30 | 29.32 | 68.69 | 4486 | 6 |
| 229.943893 | 46.53 | 44.84 | 23.39 | 74.90 | 4628 | 7 |
| 229.987152 | 42.60 | 42.23 | 40.36 | 80.12 | 1093 | 7 |
| 230.022842 | 49.37 | 44.96 | 24.77 | 78.53 | 3253 | 7 |
| 230.084045 | 51.24 | 53.06 | 30.17 | 87.56 | 4062 | 7 |
| 230.295456 | 43.11 | 40.42 | 28.85 | 72.84 | 4311 | 6 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 230.365433 | 33.79 | 37.42 | 21.61 | 62.68 | 4429 | 6 |
| 230.436081 | 29.86 | 33.79 | 23.13 | 58.43 | 4365 | 7 |
| 230.506882 | 31.86 | 41.08 | 26.36 | 65.26 | 4268 | 6 |
| 230.579102 | 28.40 | 50.55 | 19.19 | 68.13 | 4349 | 6 |
| 230.650024 | 24.94 | 43.04 | 43.96 | 73.60 | 4146 | 4 |
| 230.719391 | 23.22 | 45.81 | 83.70 | 103.70 | 4091 | 4 |
| 230.789948 | 28.52 | 44.84 | 61.49 | 89.37 | 4260 | 5 |
| 230.861511 | 29.27 | 38.79 | 49.53 | 75.51 | 4436 | 5 |
| 230.933151 | 33.70 | 40.38 | 39.23 | 73.17 | 4589 | 5 |
| 230.984543 | 40.23 | 40.40 | 14.48 | 62.72 | 1984 | 5 |
| 231.019241 | 31.95 | 39.00 | 25.62 | 66.33 | 2445 | 6 |
| 231.073746 | 36.92 | 44.86 | 15.53 | 66.17 | 4171 | 6 |
| 231.145599 | 34.03 | 43.00 | 21.93 | 65.05 | 4074 | 5 |
| 231.215836 | 32.82 | 33.32 | 26.50 | 60.12 | 4194 | 5 |
| 231.285660 | 34.98 | 33.53 | 20.09 | 57.91 | 4345 | 2 |
| 231.355835 | 25.82 | 31.27 | 16.15 | 49.88 | 4426 | 2 |
| 231.426361 | 20.88 | 31.18 | 14.32 | 45.60 | 4371 | 2 |
| 231.497086 | 22.04 | 33.37 | 18.58 | 50.90 | 4249 | 2 |
| 231.569336 | 25.01 | 41.88 | 16.12 | 56.56 | 4358 | 2 |
| 231.640335 | 22.26 | 44.85 | 14.97 | 56.53 | 4177 | 3 |
| 231.709900 | 22.11 | 40.39 | 27.02 | 57.83 | 4046 | 3 |
| 231.780319 | 27.50 | 40.04 | 26.52 | 60.26 | 4252 | 3 |
| 231.851562 | 27.07 | 37.15 | 28.93 | 60.74 | 4321 | 3 |
| 231.923233 | 32.56 | 39.78 | 31.92 | 67.21 | 4544 | 3 |
| 231.980743 | 30.36 | 45.67 | 17.60 | 63.33 | 2812 | 3 |
| 232.016769 | 39.92 | 30.60 | 41.72 | 70.28 | 1629 | 4 |
| 232.063812 | 35.36 | 44.13 | 23.47 | 67.29 | 4213 | 4 |
| 232.135864 | 33.86 | 42.68 | 20.90 | 65.62 | 3973 | 2 |
| 232.206299 | 31.57 | 34.49 | 24.83 | 58.82 | 4166 | 2 |
| 232.276154 | 35.62 | 31.55 | 22.35 | 58.46 | 4332 | 2 |
| 232.346191 | 26.41 | 32.72 | 13.64 | 49.28 | 4381 | 2 |
| 232.416779 | 19.80 | 32.85 | 14.69 | 46.37 | 4390 | 3 |
| 232.487442 | 21.51 | 33.71 | 12.52 | 47.55 | 4263 | 3 |
| 232.559601 | 23.52 | 42.96 | 13.51 | 54.75 | 4378 | 4 |
| 232.630768 | 23.77 | 43.75 | 11.62 | 55.11 | 4212 | 9 |
| 232.700714 | 20.93 | 40.11 | 26.47 | 56.84 | 3928 | 9 |
| 232.770630 | 25.60 | 41.39 | 37.37 | 66.78 | 4241 | 5 |
| 232.841675 | 25.70 | 37.64 | 38.46 | 65.67 | 4287 | 5 |
| 232.913452 | 31.52 | 37.90 | 30.22 | 65.47 | 4516 | 4 |
| 232.973999 | 34.27 | 48.37 | 24.74 | 71.53 | 3231 | 4 |
| 233.010803 | 38.23 | 27.51 | 28.50 | 57.78 | 1239 | 0 |
| 233.054031 | 34.92 | 45.10 | 35.90 | 73.20 | 4238 | 0 |
| 233.126328 | 35.19 | 42.73 | 29.13 | 70.37 | 4036 | 2 |
| 233.196823 | 31.26 | 34.82 | 30.63 | 62.21 | 4154 | 2 |
| 233.266647 | 36.41 | 30.97 | 20.34 | 57.98 | 4306 | 0 |
| 233.336594 | 26.43 | 30.73 | 12.90 | 47.32 | 4376 | 0 |
| 233.407166 | 20.63 | 29.72 | 13.65 | 44.26 | 4403 | 6 |
| 233.477829 | 20.82 | 32.33 | 19.53 | 47.85 | 4290 | 6 |
| 233.549789 | 24.70 | 40.20 | 17.44 | 55.15 | 4375 | 3 |
| 233.621124 | 22.88 | 42.00 | 17.25 | 55.22 | 4238 | 3 |
| 233.691208 | 20.41 | 41.67 | 25.62 | 57.34 | 3932 | 9 |
| 233.761002 | 23.88 | 43.19 | 41.42 | 69.50 | 4231 | 7 |
| 233.831970 | 25.28 | 40.04 | 25.46 | 58.65 | 4281 | 7 |
| 233.903687 | 30.34 | 38.27 | 37.08 | 68.25 | 4512 | 4 |
| 233.968918 | 32.24 | 41.95 | 32.13 | 70.76 | 3776 | 4 |
| 234.004166 | 50.30 | 37.20 | 36.09 | 75.51 | 712 | 7 |
| 234.044220 | 32.49 | 48.03 | 25.17 | 69.30 | 4254 | 7 |
| 234.116684 | 32.93 | 44.51 | 27.65 | 68.85 | 4016 | 7 |
| 234.187210 | 28.57 | 45.55 | 30.11 | 68.81 | 4123 | 18 |
| 234.257156 | 34.76 | 33.55 | 24.66 | 60.90 | 4277 | 6 |
| 234.326996 | 27.24 | 36.32 | 14.55 | 54.09 | 4359 | 6 |
| 234.397568 | 22.07 | 32.71 | 15.13 | 49.55 | 4414 | 12 |
| 234.468109 | 19.53 | 37.43 | 18.97 | 52.46 | 4311 | 12 |
| 234.540039 | 23.64 | 40.79 | 18.35 | 56.60 | 4382 | 6 |
| 234.611420 | 21.20 | 49.11 | 21.72 | 62.15 | 4268 | 6 |
| 234.681900 | 20.63 | 48.46 | 20.35 | 62.10 | 4033 | 6 |
| 234.751419 | 21.64 | 56.06 | 25.74 | 74.00 | 4199 | 7 |
| 234.822281 | 23.69 | 57.88 | 26.57 | 76.55 | 4268 | 7 |
| 234.893951 | 31.97 | 58.13 | 38.60 | 86.66 | 4512 | 22 |
| 234.965622 | 36.92 | 50.84 | 35.43 | 81.43 | 4633 | 22 |
| 235.035065 | 35.86 | 52.80 | 25.13 | 76.28 | 4131 | 5 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 235.105927 | 36.97 | 48.85 | 30.17 | 75.73 | 4028 | 5 |
| 235.176651 | 30.97 | 45.17 | 27.33 | 67.76 | 4117 | 5 |
| 235.246643 | 36.04 | 38.65 | 24.88 | 63.33 | 4259 | 5 |
| 235.316452 | 28.64 | 37.98 | 16.72 | 55.47 | 4345 | 3 |
| 235.387024 | 20.23 | 33.63 | 19.67 | 48.55 | 4428 | 0 |
| 235.457565 | 17.73 | 32.02 | 19.37 | 46.78 | 4308 | 0 |
| 235.529282 | 22.11 | 39.28 | 22.35 | 56.53 | 4381 | 2 |
| 235.600769 | 22.31 | 47.53 | 18.15 | 60.24 | 4294 | 2 |
| 235.671448 | 18.33 | 42.64 | 14.09 | 52.11 | 4086 | 2 |
| 235.740845 | 19.55 | 42.72 | 22.72 | 56.96 | 4162 | 2 |
| 235.811569 | 21.99 | 40.67 | 24.20 | 58.54 | 4269 | 0 |
| 235.883453 | 26.51 | 41.18 | 30.32 | 64.37 | 4505 | 3 |
| 235.954926 | 33.66 | 43.41 | 25.00 | 68.01 | 4608 | 3 |
| 235.993744 | 19.40 | 43.73 | 19.07 | 55.86 | 712 | 3 |
| 236.031387 | 37.12 | 44.39 | 33.77 | 75.51 | 3635 | 2 |
| 236.096283 | 32.23 | 47.09 | 39.66 | 79.06 | 4030 | 2 |
| 236.167099 | 28.66 | 45.24 | 37.07 | 72.19 | 4084 | 0 |
| 236.237122 | 36.37 | 37.31 | 41.98 | 76.14 | 4236 | 0 |
| 236.307007 | 25.44 | 35.08 | 42.25 | 66.71 | 4375 | 3 |
| 236.377380 | 17.66 | 33.78 | 51.89 | 69.19 | 4425 | 7 |
| 236.447952 | 16.01 | 38.21 | 51.18 | 72.49 | 4336 | 7 |
| 236.519333 | 19.29 | 44.83 | 49.98 | 79.51 | 4352 | 9 |
| 236.591095 | 21.32 | 49.92 | 44.46 | 80.52 | 4315 | 9 |
| 236.661926 | 20.06 | 44.61 | 46.16 | 74.25 | 4122 | 18 |
| 236.808411 | 28.90 | 52.00 | 54.72 | 92.81 | 3507 | 9 |
| 236.873444 | 27.70 | 46.77 | 53.62 | 88.38 | 4515 | 9 |
| 236.945221 | 33.04 | 45.53 | 45.88 | 84.54 | 4623 | 5 |
| 236.986359 | 39.62 | 62.11 | 71.50 | 113.99 | 925 | 5 |
| 237.023727 | 30.99 | 42.89 | 24.99 | 68.23 | 3427 | 9 |
| 237.086487 | 30.85 | 47.23 | 28.52 | 71.63 | 4041 | 9 |
| 237.157440 | 26.88 | 44.64 | 28.15 | 65.87 | 4062 | 15 |
| 237.227600 | 27.76 | 39.77 | 31.50 | 64.04 | 4217 | 15 |
| 237.297455 | 24.28 | 35.30 | 16.35 | 50.90 | 4362 | 12 |
| 237.367691 | 18.13 | 33.23 | 17.08 | 46.82 | 4426 | 12 |
| 237.438232 | 14.84 | 35.24 | 18.03 | 47.18 | 4347 | 7 |
| 237.509186 | 17.75 | 38.01 | 19.75 | 52.37 | 4272 | 6 |
| 237.581360 | 21.91 | 47.34 | 16.77 | 59.46 | 4339 | 6 |
| 237.652283 | 19.12 | 46.63 | 14.19 | 56.37 | 4140 | 5 |
| 237.721512 | 22.29 | 43.85 | 22.18 | 60.09 | 4097 | 5 |
| 237.792252 | 27.22 | 43.46 | 29.94 | 67.85 | 4267 | 4 |
| 237.863739 | 25.66 | 41.18 | 27.16 | 64.04 | 4442 | 4 |
| 237.935455 | 30.28 | 45.56 | 23.79 | 68.33 | 4608 | 3 |
| 237.985413 | 36.05 | 47.07 | 28.23 | 73.22 | 1810 | 3 |
| 238.020065 | 25.91 | 44.74 | 16.95 | 63.18 | 2617 | 0 |
| 238.076096 | 31.14 | 50.55 | 24.97 | 72.37 | 4152 | 0 |
| 238.147842 | 32.57 | 45.35 | 27.48 | 69.47 | 4069 | 4 |
| 238.218094 | 31.00 | 38.04 | 22.36 | 59.60 | 4210 | 4 |
| 238.287903 | 31.83 | 37.32 | 14.24 | 56.29 | 4350 | 2 |
| 238.358063 | 22.38 | 34.91 | 18.09 | 49.81 | 4427 | 2 |
| 238.428635 | 19.59 | 36.95 | 16.40 | 48.99 | 4369 | 2 |
| 238.499390 | 19.89 | 35.09 | 23.23 | 52.59 | 4247 | 2 |
| 238.571594 | 21.99 | 45.15 | 15.84 | 57.17 | 4348 | 3 |
| 238.642654 | 22.45 | 45.94 | 14.88 | 57.44 | 4166 | 3 |
| 238.712143 | 18.60 | 46.79 | 18.75 | 57.37 | 4048 | 3 |
| 238.782608 | 23.27 | 42.81 | 27.55 | 63.49 | 4249 | 6 |
| 238.853836 | 24.77 | 45.21 | 22.32 | 61.40 | 4360 | 6 |
| 238.925522 | 31.66 | 44.17 | 23.31 | 66.29 | 4546 | 4 |
| 238.981415 | 29.46 | 53.40 | 29.87 | 75.92 | 2501 | 4 |
| 239.016891 | 39.04 | 33.55 | 20.61 | 61.66 | 1709 | 4 |
| 239.065155 | 34.00 | 46.34 | 26.47 | 71.59 | 4199 | 4 |
| 239.137192 | 31.70 | 44.90 | 25.75 | 68.53 | 4049 | 5 |
| 239.207611 | 30.12 | 40.60 | 26.68 | 63.17 | 4171 | 5 |
| 239.277435 | 32.15 | 41.33 | 24.92 | 63.97 | 4325 | 6 |
| 239.347488 | 20.08 | 41.97 | 25.15 | 59.37 | 4403 | 6 |
| 239.418015 | 15.77 | 36.66 | 19.56 | 48.64 | 4381 | 5 |
| 239.488678 | 18.46 | 37.63 | 23.48 | 53.52 | 4268 | 5 |
| 239.560928 | 21.71 | 45.91 | 17.47 | 60.23 | 4377 | 6 |
| 239.632050 | 21.73 | 46.43 | 16.19 | 58.10 | 4200 | 5 |
| 239.701904 | 15.82 | 45.74 | 17.74 | 55.12 | 3943 | 5 |
| 239.771896 | 20.72 | 42.26 | 26.20 | 61.31 | 4238 | 3 |
| 239.842926 | 23.45 | 40.47 | 25.93 | 60.90 | 4286 | 3 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 239.914764 | 30.42 | 40.80 | 28.68 | 65.79 | 4529 | 3 |
| 239.975204 | 33.52 | 44.87 | 28.68 | 70.63 | 3210 | 3 |
| 240.012009 | 39.08 | 26.68 | 14.57 | 53.46 | 1251 | 7 |
| 240.055344 | 35.06 | 49.58 | 27.67 | 74.47 | 4236 | 7 |
| 240.127563 | 37.66 | 44.32 | 24.87 | 71.46 | 4028 | 4 |
| 240.198074 | 31.89 | 40.05 | 24.01 | 63.65 | 4162 | 4 |
| 240.267944 | 34.67 | 38.75 | 17.02 | 59.56 | 4302 | 3 |
| 240.337784 | 26.35 | 38.15 | 17.02 | 54.84 | 4373 | 3 |
| 240.408432 | 21.07 | 36.69 | 17.35 | 49.77 | 4398 | 4 |
| 240.479080 | 21.44 | 35.42 | 21.53 | 52.57 | 4286 | 4 |
| 240.551086 | 24.63 | 41.32 | 20.23 | 58.70 | 4372 | 12 |
| 240.622437 | 25.10 | 45.75 | 23.08 | 62.17 | 4234 | 12 |
| 240.692398 | 18.27 | 43.50 | 15.93 | 52.91 | 3928 | 7 |
| 240.762283 | 19.49 | 40.25 | 24.04 | 55.91 | 4231 | 7 |
| 240.833237 | 20.71 | 41.89 | 22.14 | 56.63 | 4277 | 7 |
| 240.905029 | 27.66 | 39.56 | 28.44 | 62.58 | 4515 | 9 |
| 240.969131 | 30.98 | 44.72 | 27.52 | 68.25 | 3641 | 9 |
| 241.004868 | 45.05 | 26.73 | 14.59 | 56.25 | 830 | 9 |
| 241.045471 | 34.06 | 49.09 | 30.41 | 75.74 | 4243 | 9 |
| 241.117889 | 35.71 | 44.73 | 30.37 | 73.34 | 4021 | 9 |
| 241.188477 | 31.05 | 41.71 | 26.19 | 65.62 | 4125 | 5 |
| 241.258408 | 32.17 | 36.30 | 17.06 | 56.54 | 4280 | 7 |
| 241.328247 | 23.17 | 41.20 | 15.88 | 55.24 | 4365 | 7 |
| 241.398849 | 18.51 | 36.22 | 22.51 | 51.49 | 4419 | 18 |
| 241.469437 | 19.00 | 36.84 | 28.92 | 56.77 | 4306 | 18 |
| 241.541382 | 22.57 | 43.71 | 36.64 | 71.35 | 4385 | 27 |
| 241.612747 | 24.43 | 47.73 | 18.33 | 61.96 | 4273 | 27 |
| 241.683167 | 20.37 | 47.58 | 19.36 | 60.39 | 4030 | 48 |
| 241.752594 | 20.75 | 60.26 | 44.45 | 90.20 | 4217 | 56 |
| 241.823517 | 22.91 | 44.05 | 27.08 | 64.47 | 4274 | 56 |
| 241.895294 | 28.53 | 52.90 | 42.54 | 82.60 | 4519 | 48 |
| 241.966019 | 37.19 | 57.77 | 47.60 | 95.53 | 4502 | 48 |
| 242.035782 | 37.18 | 71.47 | 52.88 | 112.68 | 4284 | 67 |
| 242.108276 | 36.44 | 52.60 | 42.07 | 86.94 | 4020 | 67 |
| 242.178940 | 31.71 | 49.35 | 48.83 | 84.59 | 4119 | 39 |
| 242.248917 | 37.51 | 56.12 | 46.35 | 91.02 | 4260 | 39 |
| 242.318756 | 29.01 | 42.40 | 20.32 | 61.59 | 4380 | 48 |
| 242.389206 | 23.82 | 39.38 | 26.54 | 60.39 | 4415 | 27 |
| 242.459839 | 19.39 | 38.77 | 18.34 | 53.07 | 4311 | 27 |
| 242.531586 | 25.37 | 48.32 | 27.35 | 67.58 | 4384 | 15 |
| 242.603027 | 23.18 | 51.53 | 22.12 | 66.71 | 4285 | 15 |
| 242.673706 | 22.65 | 54.18 | 32.98 | 74.95 | 4078 | 32 |
| 242.743042 | 18.36 | 50.40 | 32.69 | 70.92 | 4183 | 32 |
| 242.813843 | 25.37 | 64.99 | 53.43 | 101.30 | 4264 | 39 |
| 242.885666 | 31.68 | 48.45 | 33.48 | 75.46 | 4509 | 15 |
| 242.957153 | 39.42 | 50.82 | 33.42 | 80.96 | 4606 | 15 |
| 242.995819 | 23.77 | 49.29 | 25.92 | 64.09 | 711 | 15 |
| 243.032852 | 41.92 | 56.97 | 43.03 | 94.79 | 3599 | 22 |
| 243.097549 | 38.05 | 53.27 | 40.02 | 85.96 | 4030 | 22 |
| 243.168350 | 31.46 | 46.27 | 33.55 | 72.99 | 4106 | 15 |
| 243.238434 | 36.78 | 41.11 | 22.17 | 64.76 | 4228 | 15 |
| 243.308304 | 32.77 | 36.83 | 16.72 | 57.60 | 4384 | 7 |
| 243.378693 | 24.17 | 34.21 | 21.64 | 53.05 | 4409 | 12 |
| 243.449234 | 18.71 | 36.95 | 20.03 | 50.38 | 4326 | 12 |
| 243.520630 | 22.75 | 41.80 | 22.63 | 58.35 | 4344 | 9 |
| 243.592361 | 23.07 | 48.22 | 19.79 | 63.18 | 4298 | 9 |
| 243.663223 | 20.98 | 45.28 | 16.72 | 58.40 | 4113 | 9 |
| 243.732407 | 18.01 | 44.81 | 25.47 | 59.76 | 4157 | 9 |
| 243.803223 | 21.73 | 44.04 | 25.24 | 60.91 | 4263 | 7 |
| 243.874756 | 26.92 | 44.85 | 35.13 | 71.56 | 4514 | 7 |
| 243.946548 | 37.31 | 42.64 | 29.16 | 72.45 | 4619 | 18 |
| 243.987946 | 40.76 | 46.19 | 30.77 | 77.09 | 964 | 18 |
| 244.024994 | 33.94 | 43.23 | 25.63 | 69.20 | 3425 | 18 |
| 244.087799 | 35.40 | 50.40 | 38.90 | 81.32 | 4029 | 18 |
| 244.158722 | 34.28 | 45.62 | 33.31 | 73.62 | 4089 | 12 |
| 244.228943 | 35.23 | 37.14 | 23.42 | 62.11 | 4217 | 12 |
| 244.298752 | 31.77 | 39.71 | 17.06 | 59.04 | 4374 | 9 |
| 244.369110 | 22.63 | 35.88 | 25.56 | 54.82 | 4427 | 9 |
| 244.439560 | 17.32 | 34.64 | 28.28 | 54.72 | 4343 | 18 |
| 244.510529 | 21.01 | 38.73 | 32.39 | 62.37 | 4277 | 15 |
| 244.582672 | 22.01 | 49.22 | 25.12 | 66.12 | 4341 | 15 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 244.653580 | 21.47 | 50.14 | 22.31 | 64.11 | 4156 | 12 |
| 244.722870 | 18.01 | 48.80 | 25.50 | 63.74 | 4116 | 12 |
| 244.793549 | 23.05 | 48.52 | 28.78 | 67.98 | 4260 | 7 |
| 244.865036 | 24.06 | 50.33 | 32.27 | 71.29 | 4469 | 7 |
| 244.936859 | 29.86 | 55.22 | 37.70 | 83.35 | 4588 | 18 |
| 244.985733 | 32.09 | 54.45 | 40.13 | 84.52 | 1688 | 18 |
| 245.020493 | 29.56 | 48.81 | 27.82 | 72.02 | 2739 | 18 |
| 245.077515 | 28.79 | 53.50 | 36.72 | 80.92 | 4135 | 18 |
| 245.149139 | 28.41 | 47.42 | 30.63 | 71.78 | 4079 | 12 |
| 245.219360 | 30.29 | 41.89 | 31.00 | 66.75 | 4217 | 12 |
| 245.289246 | 29.36 | 43.74 | 22.51 | 65.48 | 4351 | 22 |
| 245.359375 | 21.03 | 33.43 | 22.57 | 51.99 | 4410 | 22 |
| 245.429932 | 16.26 | 37.72 | 18.28 | 50.59 | 4375 | 18 |
| 245.500549 | 18.70 | 37.30 | 28.54 | 58.19 | 4230 | 12 |
| 245.572922 | 24.03 | 48.37 | 22.11 | 65.25 | 4363 | 12 |
| 245.643906 | 22.08 | 50.90 | 19.25 | 64.34 | 4173 | 12 |
| 245.713394 | 22.71 | 53.59 | 22.72 | 68.58 | 4062 | 12 |
| 245.783890 | 27.73 | 54.94 | 35.43 | 80.69 | 4252 | 22 |
| 245.855133 | 23.98 | 52.64 | 24.21 | 68.62 | 4372 | 22 |
| 245.926941 | 28.40 | 49.88 | 26.46 | 70.81 | 4571 | 12 |
| 245.982346 | 30.72 | 54.10 | 37.17 | 82.88 | 2511 | 12 |
| 246.017456 | 33.85 | 40.58 | 34.21 | 72.04 | 1913 | 27 |
| 246.067474 | 27.66 | 51.28 | 39.25 | 78.90 | 4197 | 27 |
| 246.139420 | 27.20 | 54.49 | 42.94 | 84.22 | 4050 | 22 |
| 246.209900 | 26.94 | 46.64 | 38.35 | 74.47 | 4186 | 22 |
| 246.279709 | 27.69 | 54.58 | 36.09 | 79.26 | 4320 | 32 |
| 246.349792 | 19.28 | 49.69 | 34.94 | 72.31 | 4401 | 32 |
| 246.420258 | 18.54 | 57.52 | 32.61 | 75.21 | 4389 | 32 |
| 246.490997 | 18.66 | 65.60 | 30.62 | 80.53 | 4257 | 32 |
| 246.563202 | 25.28 | 67.15 | 28.05 | 85.87 | 4373 | 27 |
| 246.634293 | 27.04 | 61.47 | 27.85 | 81.55 | 4197 | 27 |
| 246.704147 | 25.87 | 60.30 | 26.01 | 79.02 | 3965 | 27 |
| 246.774185 | 30.02 | 59.34 | 24.75 | 78.51 | 4247 | 9 |
| 246.845230 | 23.26 | 51.79 | 28.97 | 71.58 | 4288 | 9 |
| 246.917023 | 31.47 | 49.11 | 36.54 | 77.65 | 4521 | 9 |
| 246.976059 | 31.05 | 44.31 | 32.28 | 70.38 | 3031 | 9 |
| 247.012558 | 37.11 | 34.55 | 7.85 | 55.27 | 1431 | 3 |
| 247.057648 | 32.37 | 47.73 | 26.07 | 71.30 | 4233 | 3 |
| 247.129898 | 32.78 | 46.90 | 26.11 | 70.18 | 4044 | 7 |
| 247.200302 | 31.54 | 39.89 | 25.61 | 62.83 | 4156 | 7 |
| 247.270187 | 31.56 | 36.76 | 16.81 | 57.26 | 4301 | 3 |
| 247.340042 | 22.77 | 35.62 | 18.52 | 52.60 | 4374 | 3 |
| 247.410690 | 17.91 | 32.92 | 18.65 | 46.84 | 4400 | 3 |
| 247.481354 | 19.28 | 32.18 | 23.59 | 51.33 | 4283 | 3 |
| 247.553436 | 22.72 | 43.76 | 20.65 | 60.02 | 4360 | 5 |
| 247.624664 | 23.03 | 47.41 | 23.07 | 64.28 | 4225 | 5 |
| 247.694702 | 15.81 | 45.72 | 15.67 | 54.41 | 3933 | 6 |
| 247.764511 | 20.95 | 41.99 | 26.50 | 60.26 | 4231 | 15 |
| 247.835281 | 22.35 | 46.32 | 31.67 | 67.44 | 4254 | 15 |
| 247.909866 | 27.67 | 50.00 | 31.76 | 75.05 | 3181 | 12 |
| 247.969208 | 31.10 | 50.72 | 33.01 | 74.61 | 3333 | 12 |
| 248.005432 | 36.03 | 32.61 | 10.84 | 53.06 | 907 | 5 |
| 248.048630 | 41.99 | 50.51 | 32.88 | 80.44 | 4017 | 5 |
| 248.119171 | 43.28 | 48.69 | 30.75 | 78.57 | 4026 | 5 |
| 248.189758 | 39.09 | 42.29 | 27.88 | 71.08 | 4136 | 4 |
| 248.259689 | 41.03 | 39.79 | 21.05 | 65.07 | 4285 | 6 |
| 248.329498 | 31.88 | 37.50 | 21.61 | 60.56 | 4357 | 6 |
| 248.400116 | 25.96 | 37.00 | 25.32 | 56.35 | 4415 | 6 |
| 248.470718 | 23.92 | 35.01 | 24.53 | 56.17 | 4304 | 6 |
| 248.542725 | 44.54 | 64.34 | 24.69 | 89.71 | 4374 | 12 |
| 248.613953 | 28.19 | 48.20 | 21.61 | 65.39 | 4261 | 12 |
| 248.684357 | 21.46 | 44.58 | 17.45 | 56.47 | 4021 | 15 |
| 248.753891 | 20.70 | 62.57 | 36.53 | 83.79 | 4223 | 67 |
| 248.824860 | 25.06 | 63.05 | 50.09 | 99.55 | 4267 | 67 |
| 248.896591 | 32.25 | 66.86 | 50.65 | 105.23 | 4525 | 27 |
| 248.966415 | 35.61 | 53.33 | 40.76 | 86.50 | 4374 | 27 |
| 249.000687 | 45.39 | 95.23 | 29.82 | 109.73 | 116 | 5 |
| 249.036972 | 35.94 | 55.24 | 38.65 | 85.32 | 4269 | 5 |
| 249.109497 | 34.41 | 48.61 | 48.28 | 87.14 | 4028 | 5 |
| 249.180191 | 26.97 | 45.54 | 61.37 | 92.68 | 4111 | 6 |
| 249.250153 | 32.16 | 43.72 | 58.04 | 91.21 | 4264 | 5 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 249.319931 | 25.15 | 44.88 | 57.92 | 89.35 | 4354 | 5 |
| 249.390472 | 19.02 | 46.44 | 57.91 | 88.51 | 4419 | 4 |
| 249.461105 | 19.01 | 44.64 | 61.23 | 90.57 | 4335 | 4 |
| 249.532867 | 32.79 | 52.81 | 57.12 | 95.20 | 4383 | 5 |
| 249.604294 | 26.73 | 48.36 | 83.44 | 107.39 | 4287 | 5 |
| 249.674973 | 25.69 | 45.15 | 56.84 | 84.87 | 4080 | 9 |
| 249.744324 | 21.14 | 47.42 | 50.50 | 78.13 | 4175 | 9 |
| 249.815170 | 25.55 | 49.24 | 30.51 | 68.11 | 4259 | 15 |
| 249.886963 | 32.37 | 48.08 | 26.07 | 68.64 | 4514 | 9 |
| 249.958542 | 37.75 | 46.00 | 27.80 | 70.40 | 4638 | 9 |
| 249.996506 | 21.46 | 39.29 | 9.79 | 47.34 | 592 | 9 |
| 250.033737 | 41.20 | 47.02 | 15.10 | 70.66 | 3691 | 5 |
| 250.099854 | 42.32 | 43.41 | 19.26 | 70.26 | 4031 | 5 |
| 250.170639 | 35.23 | 40.52 | 22.70 | 65.18 | 4104 | 3 |
| 250.240631 | 39.22 | 35.13 | 25.88 | 65.49 | 4245 | 3 |
| 250.310532 | 36.28 | 36.17 | 21.27 | 62.32 | 4374 | 5 |
| 250.380875 | 28.71 | 34.01 | 22.33 | 56.64 | 4424 | 2 |
| 250.451492 | 24.25 | 33.98 | 17.18 | 51.81 | 4301 | 2 |
| 250.522919 | 25.45 | 39.73 | 17.23 | 56.90 | 4354 | 9 |
| 250.594620 | 26.58 | 45.63 | 13.88 | 58.92 | 4311 | 9 |
| 250.665451 | 25.19 | 42.33 | 14.71 | 56.58 | 4116 | 27 |
| 250.734711 | 21.61 | 40.82 | 35.25 | 65.58 | 4167 | 27 |
| 250.805435 | 22.32 | 52.30 | 27.79 | 70.09 | 4271 | 22 |
| 250.877121 | 26.33 | 44.70 | 27.19 | 63.69 | 4497 | 27 |
| 250.948776 | 37.21 | 45.65 | 26.34 | 69.99 | 4629 | 27 |
| 250.989899 | 42.06 | 48.00 | 15.02 | 70.95 | 915 | 27 |
| 251.026947 | 34.75 | 44.37 | 39.26 | 75.51 | 3461 | 15 |
| 251.090225 | 37.35 | 48.00 | 30.27 | 76.53 | 4018 | 15 |
| 251.161026 | 33.81 | 43.73 | 25.89 | 68.31 | 4088 | 12 |
| 251.231140 | 36.11 | 39.25 | 37.67 | 72.39 | 4232 | 12 |
| 251.301041 | 32.83 | 37.81 | 26.26 | 63.05 | 4365 | 15 |
| 251.371292 | 24.64 | 38.69 | 23.70 | 58.23 | 4426 | 15 |
| 251.441879 | 21.38 | 38.19 | 15.87 | 52.47 | 4327 | 12 |
| 251.512848 | 23.28 | 40.76 | 22.24 | 58.64 | 4288 | 12 |
| 251.584900 | 25.86 | 49.06 | 26.87 | 67.77 | 4335 | 12 |
| 251.655838 | 24.72 | 48.68 | 19.84 | 63.86 | 4140 | 18 |
| 251.725098 | 20.76 | 49.08 | 25.50 | 64.70 | 4128 | 18 |
| 251.795776 | 26.22 | 47.45 | 21.19 | 64.30 | 4266 | 18 |
| 251.867264 | 27.04 | 48.04 | 32.55 | 69.36 | 4474 | 18 |
| 251.938965 | 32.00 | 51.94 | 29.37 | 77.63 | 4607 | 18 |
| 251.986465 | 33.38 | 58.50 | 37.61 | 86.01 | 1493 | 18 |
| 252.020950 | 36.73 | 47.29 | 19.29 | 71.89 | 2853 | 15 |
| 252.078812 | 34.17 | 51.99 | 21.07 | 72.89 | 4131 | 15 |
| 252.150421 | 34.62 | 44.60 | 20.29 | 67.15 | 4076 | 7 |
| 252.220657 | 33.35 | 39.14 | 23.70 | 64.11 | 4213 | 7 |
| 252.290558 | 33.18 | 35.82 | 20.54 | 59.22 | 4337 | 12 |
| 252.360748 | 25.46 | 34.44 | 20.82 | 53.78 | 4431 | 12 |
| 252.431229 | 19.28 | 42.29 | 21.38 | 55.98 | 4364 | 22 |
| 252.501862 | 15.96 | 44.45 | 26.31 | 61.96 | 4249 | 22 |
| 252.574219 | 23.37 | 57.64 | 31.55 | 78.02 | 4357 | 22 |
| 252.645157 | 22.37 | 51.35 | 23.26 | 66.31 | 4158 | 22 |
| 252.714600 | 19.21 | 50.55 | 23.41 | 64.12 | 4070 | 22 |
| 252.785110 | 22.20 | 45.60 | 29.14 | 66.25 | 4271 | 15 |
| 252.856476 | 25.39 | 49.45 | 27.04 | 68.08 | 4383 | 15 |
| 252.928360 | 32.55 | 51.68 | 33.36 | 77.78 | 4598 | 22 |
| 252.982773 | 34.52 | 55.42 | 37.43 | 83.57 | 2401 | 22 |
| 253.017761 | 34.45 | 43.18 | 24.17 | 67.70 | 2040 | 9 |
| 253.068741 | 33.05 | 51.25 | 26.48 | 73.69 | 4188 | 9 |
| 253.140671 | 33.50 | 46.44 | 29.13 | 71.99 | 4052 | 7 |
| 253.211151 | 32.87 | 40.69 | 26.09 | 64.94 | 4184 | 7 |
| 253.280975 | 32.89 | 40.37 | 15.18 | 59.71 | 4318 | 6 |
| 253.351151 | 23.01 | 37.62 | 16.99 | 52.99 | 4413 | 6 |
| 253.421585 | 17.45 | 35.80 | 18.15 | 48.71 | 4395 | 5 |
| 253.492279 | 20.35 | 33.31 | 24.88 | 52.99 | 4265 | 5 |
| 253.564621 | 23.65 | 43.77 | 19.31 | 59.38 | 4324 | 7 |
| 253.635559 | 22.06 | 48.63 | 17.59 | 61.05 | 4189 | 4 |
| 253.705292 | 17.51 | 45.36 | 18.79 | 55.87 | 3988 | 4 |
| 253.775482 | 24.72 | 43.02 | 25.07 | 61.48 | 4253 | 2 |
| 253.846512 | 24.34 | 40.85 | 25.05 | 59.66 | 4297 | 2 |
| 253.918304 | 29.86 | 43.85 | 28.59 | 67.66 | 4526 | 0 |
| 253.977219 | 30.34 | 47.90 | 31.29 | 71.85 | 2882 | 0 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 254.013153 | 40.09 | 32.34 | 9.72 | 55.45 | 1516 | 0 |
| 254.058929 | 32.85 | 46.26 | 25.88 | 69.77 | 4231 | 0 |
| 254.131119 | 34.12 | 46.68 | 27.02 | 71.53 | 4035 | 2 |
| 254.201584 | 32.42 | 40.38 | 23.94 | 63.14 | 4164 | 2 |
| 254.271439 | 33.21 | 37.90 | 14.93 | 57.46 | 4310 | 3 |
| 254.341476 | 23.47 | 38.10 | 16.58 | 53.00 | 4386 | 3 |
| 254.411987 | 17.20 | 36.71 | 17.71 | 48.34 | 4407 | 6 |
| 254.482620 | 18.29 | 33.38 | 25.90 | 52.53 | 4281 | 6 |
| 254.554749 | 23.78 | 43.65 | 18.70 | 59.21 | 4365 | 4 |
| 254.625961 | 23.49 | 47.23 | 19.63 | 61.25 | 4226 | 5 |
| 254.695908 | 16.30 | 43.92 | 18.75 | 53.85 | 3923 | 5 |
| 254.765869 | 21.78 | 42.86 | 26.25 | 60.17 | 4229 | 6 |
| 254.836823 | 22.94 | 41.37 | 24.88 | 59.82 | 4281 | 6 |
| 254.908585 | 29.49 | 47.30 | 29.11 | 69.14 | 4512 | 5 |
| 254.970093 | 31.43 | 45.86 | 28.88 | 70.90 | 3338 | 5 |
| 255.006607 | 37.06 | 29.42 | 9.19 | 51.23 | 1129 | 0 |
| 255.049149 | 32.89 | 46.37 | 28.50 | 71.59 | 4248 | 0 |
| 255.121536 | 33.46 | 46.16 | 27.04 | 71.36 | 4028 | 0 |
| 255.192078 | 30.53 | 40.53 | 24.77 | 63.36 | 4139 | 0 |
| 255.261917 | 30.04 | 38.47 | 15.66 | 56.13 | 4293 | 2 |
| 255.331894 | 23.28 | 37.60 | 17.17 | 52.51 | 4374 | 2 |
| 255.402298 | 17.25 | 37.14 | 15.30 | 47.86 | 4398 | 4 |
| 255.472992 | 19.59 | 36.36 | 17.07 | 50.19 | 4300 | 4 |
| 255.544952 | 23.16 | 42.93 | 16.30 | 56.91 | 4374 | 5 |
| 255.616287 | 23.40 | 45.92 | 17.54 | 59.16 | 4261 | 5 |
| 255.686584 | 17.65 | 44.49 | 17.81 | 54.60 | 3998 | 9 |
| 255.756149 | 20.93 | 44.71 | 27.44 | 62.18 | 4219 | 5 |
| 255.827133 | 20.54 | 46.73 | 27.94 | 63.29 | 4276 | 5 |
| 255.898880 | 27.25 | 44.58 | 30.73 | 67.25 | 4514 | 6 |
| 255.967407 | 32.70 | 44.59 | 29.09 | 69.83 | 4201 | 6 |
| 256.001404 | 42.95 | 37.07 | 19.65 | 60.64 | 235 | 7 |
| 256.038300 | 35.01 | 51.89 | 29.74 | 77.92 | 4253 | 7 |
| 256.110748 | 37.91 | 48.21 | 32.75 | 78.28 | 4020 | 7 |
| 256.181519 | 30.14 | 53.05 | 42.80 | 83.32 | 4121 | 18 |
| 256.251434 | 32.89 | 38.45 | 21.84 | 59.97 | 4275 | 12 |
| 256.321350 | 26.85 | 39.56 | 14.79 | 55.66 | 4352 | 12 |
| 256.391785 | 19.44 | 39.18 | 23.25 | 54.34 | 4412 | 27 |
| 256.462402 | 16.06 | 43.48 | 30.02 | 62.78 | 4325 | 27 |
| 256.534180 | 22.03 | 62.82 | 38.56 | 88.77 | 4378 | 32 |
| 256.605652 | 22.57 | 61.56 | 38.00 | 87.56 | 4286 | 32 |
| 256.676270 | 20.85 | 62.03 | 28.17 | 82.61 | 4077 | 15 |
| 256.745636 | 24.69 | 71.66 | 36.25 | 97.66 | 4187 | 15 |
| 256.816437 | 25.80 | 71.40 | 37.50 | 99.94 | 4279 | 32 |
| 256.888336 | 29.56 | 61.57 | 45.82 | 95.31 | 4523 | 27 |
| 256.959839 | 36.66 | 52.92 | 26.83 | 77.70 | 4627 | 27 |
| 256.997162 | 22.37 | 63.47 | 14.79 | 73.02 | 423 | 27 |
| 257.034058 | 44.26 | 66.20 | 44.08 | 100.78 | 3816 | 27 |
| 257.101135 | 50.37 | 57.79 | 45.03 | 98.41 | 4032 | 27 |
| 257.171906 | 41.56 | 50.73 | 47.64 | 89.28 | 4105 | 22 |
| 257.241913 | 44.38 | 44.80 | 30.10 | 75.14 | 4260 | 22 |
| 257.311920 | 38.65 | 42.30 | 16.94 | 65.27 | 4394 | 6 |
| 257.382202 | 32.25 | 35.67 | 21.14 | 58.19 | 4425 | 3 |
| 257.452820 | 25.77 | 35.02 | 22.30 | 55.51 | 4300 | 3 |
| 257.524231 | 30.00 | 46.44 | 20.21 | 65.69 | 4348 | 5 |
| 257.595947 | 27.73 | 52.29 | 17.16 | 67.60 | 4306 | 5 |
| 257.666718 | 28.25 | 48.36 | 16.16 | 64.38 | 4111 | 5 |
| 257.736237 | 20.82 | 39.61 | 24.25 | 57.26 | 4136 | 5 |
| 257.806702 | 25.95 | 39.73 | 25.80 | 60.85 | 4266 | 4 |
| 257.878540 | 32.41 | 41.15 | 32.16 | 68.09 | 4484 | 6 |
| 257.950104 | 40.46 | 45.25 | 30.11 | 73.84 | 4623 | 6 |
| 257.991180 | 38.16 | 50.62 | 30.51 | 73.52 | 928 | 6 |
| 258.028351 | 47.01 | 44.28 | 26.81 | 77.93 | 3448 | 4 |
| 258.091492 | 46.17 | 51.08 | 32.48 | 83.95 | 4021 | 4 |
| 258.162323 | 39.22 | 47.81 | 31.11 | 76.09 | 4096 | 7 |
| 258.232391 | 41.85 | 42.96 | 26.68 | 71.39 | 4237 | 7 |
| 258.302338 | 37.16 | 41.93 | 18.61 | 64.15 | 4372 | 6 |
| 258.372589 | 29.52 | 37.44 | 19.07 | 56.31 | 4428 | 6 |
| 258.443146 | 24.76 | 36.11 | 18.56 | 53.41 | 4333 | 3 |
| 258.514221 | 24.75 | 41.61 | 22.83 | 60.17 | 4285 | 3 |
| 258.586243 | 26.49 | 50.20 | 17.99 | 66.30 | 4334 | 3 |
| 258.657166 | 25.74 | 48.42 | 19.43 | 65.02 | 4154 | 4 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|-----|
| 258.726410 | 18.83 | 43.53 | 25.24 | 58.94 | 4141 | 4 |
| 258.797089 | 21.92 | 45.14 | 26.88 | 62.16 | 4278 | 4 |
| 258.868591 | 25.37 | 43.59 | 28.64 | 63.15 | 4484 | 4 |
| 258.940338 | 33.97 | 46.41 | 28.80 | 70.22 | 4611 | 4 |
| 258.986633 | 31.80 | 52.63 | 39.97 | 77.66 | 1389 | 4 |
| 259.021851 | 36.50 | 43.49 | 22.86 | 68.65 | 3027 | 2 |
| 259.081329 | 37.10 | 48.53 | 31.43 | 77.13 | 4101 | 2 |
| 259.152710 | 32.51 | 45.96 | 27.62 | 70.43 | 4083 | 12 |
| 259.222992 | 30.14 | 39.26 | 18.39 | 57.66 | 4204 | 12 |
| 259.292755 | 29.61 | 40.46 | 13.05 | 56.54 | 4349 | 3 |
| 259.363007 | 21.53 | 37.13 | 17.88 | 50.94 | 4433 | 3 |
| 259.433533 | 17.52 | 35.83 | 14.58 | 46.03 | 4351 | 4 |
| 259.504181 | 20.58 | 35.74 | 19.04 | 51.13 | 4237 | 4 |
| 259.576538 | 24.57 | 45.67 | 17.05 | 59.67 | 4350 | 4 |
| 259.647461 | 22.66 | 45.34 | 14.89 | 57.52 | 4166 | 6 |
| 259.716888 | 18.72 | 42.98 | 18.78 | 54.44 | 4096 | 6 |
| 259.787415 | 23.32 | 42.89 | 24.43 | 59.76 | 4266 | 18 |
| 259.858795 | 22.88 | 47.00 | 29.52 | 67.05 | 4405 | 18 |
| 259.930603 | 31.09 | 51.96 | 40.76 | 83.44 | 4606 | 48 |
| 259.983734 | 34.15 | 61.11 | 39.72 | 93.10 | 2220 | 48 |
| 260.018097 | 30.51 | 55.71 | 34.49 | 84.49 | 2154 | 22 |
| 260.070129 | 31.30 | 58.41 | 35.78 | 86.72 | 4181 | 22 |
| 260.141998 | 29.63 | 48.61 | 31.64 | 72.44 | 4059 | 15 |
| 260.212372 | 29.57 | 39.54 | 25.54 | 61.97 | 4182 | 15 |
| 260.282288 | 29.51 | 37.25 | 14.11 | 55.04 | 4335 | 12 |
| 260.352417 | 18.92 | 36.93 | 18.75 | 50.36 | 4412 | 12 |
| 260.422943 | 14.43 | 39.91 | 17.92 | 49.54 | 4377 | 18 |
| 260.493561 | 17.84 | 34.80 | 27.79 | 54.11 | 4263 | 18 |
| 260.565826 | 23.02 | 50.41 | 31.08 | 71.66 | 4374 | 15 |
| 260.636841 | 21.25 | 52.75 | 25.07 | 67.24 | 4181 | 22 |
| 260.706451 | 20.98 | 49.85 | 26.78 | 67.83 | 4023 | 22 |
| 260.776855 | 23.62 | 58.23 | 35.42 | 78.99 | 4239 | 32 |
| 260.847778 | 22.77 | 46.65 | 35.83 | 70.66 | 4302 | 32 |
| 260.919708 | 33.94 | 88.98 | 82.45 | 145.18 | 4534 | 94 |
| 260.978119 | 36.49 | 71.43 | 45.49 | 103.35 | 2948 | 94 |
| 261.014648 | 46.64 | 67.01 | 41.66 | 101.67 | 1503 | 39 |
| 261.060303 | 30.71 | 64.72 | 33.48 | 88.09 | 4215 | 39 |
| 261.132294 | 35.79 | 52.89 | 37.13 | 82.27 | 4038 | 27 |
| 261.202789 | 33.71 | 41.69 | 27.11 | 67.45 | 4158 | 27 |
| 261.272919 | 36.70 | 43.04 | 18.36 | 63.92 | 4188 | 9 |
| 261.342773 | 23.26 | 40.43 | 19.45 | 56.97 | 4288 | 9 |
| 261.413269 | 18.15 | 38.73 | 18.50 | 52.60 | 4298 | 15 |
| 261.483887 | 19.35 | 40.00 | 25.56 | 59.03 | 4180 | 15 |
| 261.556030 | 26.61 | 62.62 | 41.43 | 88.44 | 4279 | 27 |
| 261.627228 | 22.72 | 49.06 | 28.66 | 67.66 | 4121 | 39 |
| 261.697235 | 17.09 | 41.98 | 17.46 | 52.41 | 3825 | 39 |
| 261.767181 | 24.46 | 58.48 | 28.60 | 75.39 | 4125 | 56 |
| 261.838104 | 24.44 | 56.39 | 42.55 | 88.26 | 4192 | 56 |
| 261.909912 | 51.75 | 238.50 | 177.88 | 328.72 | 4417 | 236 |
| 261.970673 | 68.63 | 171.16 | 69.88 | 216.53 | 3173 | 236 |
| 262.007477 | 73.97 | 340.01 | 84.27 | 374.00 | 1187 | 179 |
| 262.050629 | 50.28 | 162.67 | 56.57 | 199.87 | 4219 | 179 |
| 262.122803 | 44.44 | 113.59 | 37.30 | 138.42 | 4035 | 179 |
| 262.193298 | 37.09 | 88.71 | 45.47 | 116.58 | 4143 | 67 |
| 262.263214 | 41.85 | 77.70 | 40.30 | 109.01 | 4297 | 48 |
| 262.333191 | 32.30 | 64.14 | 34.87 | 91.41 | 4377 | 48 |
| 262.546295 | 24.77 | 75.60 | 28.21 | 90.43 | 4381 | 80 |
| 262.617676 | 26.57 | 76.90 | 52.47 | 107.88 | 4237 | 80 |
| 262.687927 | 22.65 | 69.45 | 19.11 | 87.58 | 4000 | 80 |
| 262.757507 | 30.96 | 73.44 | 27.13 | 97.30 | 4219 | 15 |
| 262.828491 | 30.99 | 67.34 | 31.94 | 94.89 | 4271 | 15 |
| 262.900208 | 34.22 | 60.45 | 31.70 | 88.91 | 4513 | 15 |
| 262.967773 | 39.52 | 61.47 | 29.03 | 87.68 | 4070 | 15 |
| 263.002441 | 43.12 | 104.80 | 22.12 | 115.95 | 414 | 15 |
| 263.040680 | 36.65 | 60.40 | 28.21 | 84.98 | 4256 | 15 |
| 263.113159 | 36.36 | 57.81 | 34.82 | 84.73 | 4025 | 15 |
| 263.183807 | 31.66 | 50.98 | 35.79 | 78.36 | 4119 | 15 |
| 263.253693 | 37.37 | 41.77 | 24.85 | 68.16 | 4282 | 15 |
| 263.323517 | 27.87 | 38.50 | 14.80 | 55.37 | 4347 | 15 |
| 263.394043 | 18.69 | 44.14 | 29.48 | 62.10 | 4413 | 48 |
| 263.464600 | 15.47 | 53.71 | 50.11 | 83.52 | 4306 | 48 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 263.536530 | 24.86 | 89.37 | 60.75 | 120.98 | 4384 | 80 |
| 263.607941 | 24.25 | 78.57 | 35.41 | 100.14 | 4274 | 80 |
| 263.678558 | 21.68 | 65.19 | 15.04 | 80.15 | 4071 | 27 |
| 263.747833 | 25.94 | 56.84 | 27.31 | 81.47 | 4198 | 27 |
| 263.818756 | 28.13 | 54.66 | 25.10 | 77.80 | 4287 | 15 |
| 263.890564 | 34.17 | 54.75 | 38.92 | 86.52 | 4519 | 22 |
| 263.962097 | 38.81 | 61.46 | 39.11 | 93.97 | 4637 | 22 |
| 263.998260 | 21.82 | 87.50 | 20.05 | 95.00 | 295 | 22 |
| 264.034302 | 39.68 | 56.68 | 38.23 | 91.70 | 3906 | 22 |
| 264.102478 | 34.90 | 58.97 | 32.46 | 83.23 | 4029 | 22 |
| 264.173157 | 30.94 | 53.30 | 42.88 | 83.88 | 4108 | 22 |
| 264.243225 | 35.78 | 39.95 | 26.47 | 66.92 | 4271 | 22 |
| 264.313232 | 29.90 | 40.23 | 17.11 | 59.38 | 4388 | 4 |
| 264.383484 | 21.33 | 37.57 | 20.21 | 54.97 | 4420 | 12 |
| 264.454132 | 19.25 | 40.36 | 18.65 | 54.05 | 4311 | 12 |
| 264.525635 | 21.61 | 51.29 | 30.36 | 71.37 | 4341 | 18 |
| 264.597290 | 22.77 | 54.79 | 19.54 | 69.94 | 4317 | 18 |
| 264.667999 | 19.84 | 53.69 | 16.56 | 64.71 | 4110 | 7 |
| 264.734955 | 23.31 | 50.27 | 27.34 | 69.91 | 3877 | 7 |
| 264.807434 | 29.21 | 46.37 | 25.11 | 68.05 | 4035 | 6 |
| 264.879913 | 34.72 | 43.54 | 29.92 | 70.83 | 4485 | 6 |
| 264.951447 | 43.43 | 48.50 | 30.15 | 78.80 | 4624 | 6 |
| 264.991272 | 35.77 | 46.17 | 22.93 | 68.84 | 806 | 6 |
| 265.028687 | 46.44 | 45.04 | 30.04 | 78.59 | 3556 | 7 |
| 265.092773 | 44.91 | 50.59 | 33.25 | 83.18 | 4020 | 7 |
| 265.163483 | 39.29 | 49.64 | 34.87 | 78.67 | 4083 | 12 |
| 265.233734 | 43.09 | 44.55 | 29.92 | 73.90 | 4244 | 12 |
| 265.303650 | 38.73 | 40.19 | 15.61 | 62.76 | 4378 | 7 |
| 265.373901 | 30.06 | 44.25 | 27.59 | 65.56 | 4429 | 7 |
| 265.444489 | 22.40 | 38.15 | 21.94 | 54.71 | 4321 | 15 |
| 265.515503 | 25.22 | 45.63 | 24.08 | 64.16 | 4293 | 12 |
| 265.587524 | 26.98 | 54.74 | 20.49 | 71.15 | 4332 | 12 |
| 265.658417 | 27.75 | 49.47 | 16.71 | 66.30 | 4151 | 6 |
| 265.727661 | 21.57 | 45.14 | 23.49 | 61.71 | 4157 | 6 |
| 265.798401 | 25.50 | 42.76 | 30.86 | 66.47 | 4274 | 7 |
| 265.869873 | 30.52 | 40.63 | 28.86 | 65.43 | 4510 | 7 |
| 265.941650 | 39.38 | 43.26 | 31.17 | 73.99 | 4623 | 6 |
| 265.986755 | 40.57 | 51.67 | 44.75 | 85.09 | 1268 | 6 |
| 266.022369 | 41.17 | 44.69 | 31.89 | 76.20 | 3146 | 12 |
| 266.074615 | 36.76 | 50.58 | 45.06 | 85.25 | 3178 | 12 |
| 266.153992 | 37.66 | 47.17 | 32.32 | 75.58 | 4085 | 9 |
| 266.224213 | 37.63 | 41.70 | 30.97 | 69.51 | 4215 | 9 |
| 266.294006 | 35.80 | 40.52 | 16.60 | 61.62 | 4344 | 6 |
| 266.364288 | 27.04 | 35.39 | 19.55 | 53.74 | 4420 | 6 |
| 266.514404 | 21.38 | 31.55 | 30.05 | 55.65 | 3237 | 6 |
| 266.577820 | 24.73 | 48.98 | 19.78 | 65.41 | 4347 | 6 |
| 266.648773 | 24.00 | 48.00 | 18.65 | 63.30 | 4168 | 5 |
| 266.718140 | 21.00 | 43.84 | 19.67 | 57.25 | 4107 | 5 |
| 266.788727 | 24.44 | 44.75 | 25.13 | 63.76 | 4263 | 6 |
| 266.860138 | 27.45 | 40.95 | 24.72 | 62.69 | 4421 | 6 |
| 266.931793 | 36.86 | 43.39 | 29.16 | 71.34 | 4565 | 3 |
| 266.984222 | 39.91 | 45.39 | 34.16 | 77.84 | 2107 | 3 |
| 267.018890 | 33.84 | 36.93 | 23.71 | 64.04 | 2332 | 7 |
| 267.072540 | 39.61 | 49.76 | 37.12 | 81.59 | 4168 | 7 |
| 267.144379 | 35.13 | 52.21 | 35.59 | 79.01 | 4069 | 15 |
| 267.214722 | 36.58 | 39.81 | 30.17 | 68.03 | 4196 | 15 |
| 267.284485 | 35.78 | 40.40 | 16.62 | 61.66 | 4320 | 6 |
| 267.354675 | 25.55 | 35.84 | 17.26 | 52.54 | 4417 | 6 |
| 267.425171 | 20.10 | 34.70 | 20.45 | 50.43 | 4375 | 4 |
| 267.495850 | 22.09 | 34.95 | 29.21 | 59.14 | 4263 | 4 |
| 267.568115 | 23.64 | 46.62 | 20.05 | 62.08 | 4372 | 6 |
| 267.639130 | 23.42 | 47.24 | 18.17 | 61.42 | 4184 | 6 |
| 267.708679 | 19.24 | 43.33 | 21.29 | 57.02 | 4055 | 6 |
| 267.779144 | 23.03 | 41.16 | 25.25 | 60.25 | 4241 | 5 |
| 267.850098 | 22.91 | 40.80 | 21.65 | 58.56 | 4311 | 5 |
| 267.922028 | 30.10 | 44.60 | 26.34 | 67.37 | 4551 | 4 |
| 267.980286 | 30.74 | 49.34 | 33.11 | 74.91 | 2938 | 4 |
| 268.016113 | 35.58 | 31.10 | 10.52 | 51.72 | 1487 | 2 |
| 268.061554 | 31.01 | 46.30 | 29.29 | 70.82 | 4209 | 2 |
| 268.133698 | 28.81 | 45.67 | 27.55 | 68.67 | 4054 | 5 |
| 268.204193 | 29.92 | 41.30 | 25.20 | 63.63 | 4176 | 5 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 268.274048 | 31.98 | 38.32 | 15.58 | 57.79 | 4320 | 3 |
| 268.344116 | 22.31 | 37.28 | 18.03 | 52.80 | 4398 | 3 |
| 268.414581 | 17.19 | 35.29 | 16.81 | 46.99 | 4386 | 4 |
| 268.485260 | 20.26 | 36.02 | 23.59 | 54.11 | 4282 | 4 |
| 268.557373 | 23.14 | 42.99 | 17.20 | 57.72 | 4372 | 5 |
| 268.628448 | 21.96 | 47.58 | 16.66 | 59.87 | 4211 | 15 |
| 268.698425 | 17.04 | 43.03 | 21.94 | 55.33 | 3912 | 15 |
| 268.768463 | 24.05 | 47.93 | 22.36 | 64.56 | 4231 | 48 |
| 268.839417 | 24.09 | 56.03 | 45.47 | 88.12 | 4294 | 48 |
| 268.911285 | 28.61 | 57.77 | 42.78 | 89.04 | 4530 | 18 |
| 268.972046 | 34.74 | 59.50 | 39.96 | 89.55 | 3254 | 18 |
| 269.008881 | 27.59 | 38.17 | 18.46 | 54.97 | 1211 | 12 |
| 269.051788 | 29.65 | 55.04 | 37.83 | 81.97 | 4239 | 12 |
| 269.124146 | 30.05 | 48.99 | 34.26 | 75.64 | 4015 | 12 |
| 269.194641 | 29.83 | 42.40 | 30.93 | 68.40 | 4144 | 12 |
| 269.270905 | 31.35 | 37.68 | 29.74 | 65.61 | 3530 | 15 |
| 269.325592 | 24.63 | 39.02 | 30.27 | 62.03 | 3366 | 15 |
| 269.405029 | 16.89 | 45.24 | 24.13 | 58.77 | 4395 | 18 |
| 269.475555 | 19.99 | 38.99 | 26.78 | 57.00 | 4287 | 18 |
| 269.547668 | 22.51 | 45.36 | 19.18 | 60.69 | 4370 | 18 |
| 269.618927 | 25.28 | 53.24 | 34.37 | 78.64 | 4251 | 18 |
| 269.689117 | 19.92 | 54.46 | 34.50 | 76.87 | 3989 | 27 |
| 269.758820 | 27.17 | 71.96 | 35.79 | 94.31 | 4218 | 22 |
| 269.829773 | 23.54 | 59.41 | 32.84 | 80.31 | 4280 | 22 |
| 269.901550 | 31.93 | 64.27 | 51.34 | 99.04 | 4516 | 27 |
| 269.968109 | 39.08 | 53.53 | 48.03 | 94.84 | 3940 | 27 |
| 270.003082 | 47.46 | 69.54 | 26.92 | 89.99 | 525 | 39 |
| 270.041992 | 35.87 | 65.62 | 47.96 | 102.05 | 4256 | 39 |
| 270.114441 | 36.74 | 59.32 | 48.36 | 95.82 | 4026 | 39 |
| 270.184906 | 32.48 | 48.41 | 31.34 | 72.93 | 4050 | 27 |
| 270.255096 | 36.86 | 49.51 | 34.26 | 77.76 | 4283 | 22 |
| 270.323090 | 31.83 | 45.70 | 20.70 | 64.75 | 4138 | 22 |
| 270.395355 | 19.22 | 43.38 | 32.82 | 64.28 | 4412 | 22 |
| 270.465912 | 19.61 | 42.52 | 28.81 | 62.17 | 4311 | 22 |
| 270.537842 | 23.41 | 48.56 | 25.98 | 67.32 | 4381 | 32 |
| 270.609222 | 25.74 | 58.83 | 39.66 | 88.70 | 4279 | 32 |
| 270.679840 | 22.40 | 53.53 | 25.25 | 71.37 | 4062 | 15 |
| 270.749237 | 20.26 | 52.87 | 31.00 | 73.76 | 4201 | 15 |
| 270.820038 | 25.61 | 53.42 | 33.66 | 77.94 | 4265 | 15 |
| 270.891846 | 30.41 | 53.41 | 33.76 | 78.60 | 4513 | 18 |
| 270.963440 | 37.19 | 52.88 | 35.13 | 81.48 | 4622 | 18 |
| 270.998932 | 20.54 | 89.42 | 11.84 | 92.90 | 177 | 18 |
| 271.035095 | 39.26 | 55.13 | 32.00 | 83.53 | 4059 | 12 |
| 271.104828 | 36.88 | 49.91 | 35.31 | 79.37 | 4026 | 12 |
| 271.175507 | 32.40 | 47.85 | 31.93 | 73.39 | 4109 | 12 |
| 271.245544 | 35.88 | 46.85 | 35.74 | 75.37 | 4260 | 12 |
| 271.315369 | 31.23 | 40.61 | 19.36 | 60.36 | 4370 | 18 |
| 271.385742 | 22.99 | 37.87 | 21.53 | 55.45 | 4421 | 12 |
| 271.456360 | 18.39 | 35.74 | 26.11 | 54.14 | 4322 | 12 |
| 271.527954 | 24.04 | 42.25 | 29.61 | 64.10 | 4354 | 9 |
| 271.599548 | 25.68 | 52.25 | 28.18 | 71.98 | 4303 | 9 |
| 271.670288 | 21.02 | 48.55 | 19.46 | 61.66 | 4105 | 9 |
| 271.739655 | 19.07 | 46.90 | 28.53 | 63.36 | 4169 | 9 |
| 271.810455 | 24.98 | 45.32 | 30.07 | 66.50 | 4268 | 7 |
| 271.882263 | 27.45 | 48.97 | 38.09 | 74.50 | 4481 | 12 |
| 271.953735 | 35.20 | 51.32 | 34.86 | 81.39 | 4611 | 12 |
| 271.992188 | 23.55 | 44.75 | 24.91 | 61.65 | 671 | 12 |
| 272.029480 | 38.67 | 48.28 | 36.24 | 81.72 | 3621 | 9 |
| 272.094086 | 34.81 | 51.53 | 38.00 | 81.18 | 4018 | 9 |
| 272.164917 | 31.86 | 49.48 | 38.81 | 79.84 | 4093 | 22 |
| 272.235077 | 33.69 | 39.79 | 26.80 | 63.58 | 4231 | 22 |
| 272.304932 | 30.13 | 38.81 | 17.01 | 57.11 | 4373 | 6 |
| 272.375153 | 20.52 | 36.01 | 25.47 | 54.37 | 4415 | 18 |
| 272.445831 | 16.69 | 36.38 | 23.76 | 52.17 | 4332 | 18 |
| 272.516907 | 19.32 | 43.92 | 29.45 | 64.75 | 4304 | 18 |
| 272.588898 | 23.27 | 57.79 | 35.09 | 80.91 | 4339 | 18 |
| 272.659851 | 27.63 | 53.21 | 27.43 | 73.38 | 3656 | 12 |
| 272.728973 | 22.66 | 46.10 | 26.57 | 65.51 | 4160 | 12 |
| 272.799713 | 25.92 | 43.49 | 29.57 | 66.73 | 4272 | 4 |
| 272.871277 | 33.24 | 40.63 | 31.52 | 68.46 | 4502 | 4 |
| 272.943054 | 42.37 | 47.83 | 29.42 | 76.05 | 4619 | 3 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 272.986816 | 43.91 | 54.16 | 36.70 | 83.06 | 1136 | 3 |
| 273.022858 | 43.97 | 43.29 | 25.74 | 74.55 | 3261 | 7 |
| 273.084198 | 43.53 | 49.98 | 33.77 | 82.30 | 4049 | 7 |
| 273.155304 | 40.26 | 47.67 | 34.03 | 78.23 | 4089 | 9 |
| 273.225525 | 40.52 | 39.27 | 26.63 | 68.25 | 4220 | 9 |
| 273.295258 | 38.59 | 38.88 | 15.25 | 61.77 | 4315 | 3 |
| 273.365723 | 29.92 | 36.76 | 20.95 | 57.25 | 4407 | 3 |
| 273.436157 | 23.12 | 35.82 | 22.49 | 53.60 | 4349 | 9 |
| 273.506805 | 24.16 | 39.55 | 27.91 | 60.79 | 4234 | 7 |
| 273.579132 | 26.74 | 54.44 | 27.69 | 74.54 | 4342 | 7 |
| 273.650116 | 26.20 | 50.45 | 27.38 | 70.43 | 4163 | 6 |
| 273.719452 | 22.00 | 46.58 | 22.86 | 63.26 | 4115 | 6 |
| 273.790070 | 25.74 | 45.26 | 26.72 | 65.98 | 4259 | 6 |
| 273.861511 | 29.77 | 45.73 | 27.28 | 69.32 | 4427 | 6 |
| 273.933167 | 39.52 | 49.98 | 27.91 | 76.34 | 4589 | 6 |
| 273.984619 | 44.51 | 48.89 | 31.72 | 83.16 | 1991 | 6 |
| 274.019348 | 39.43 | 49.78 | 35.97 | 79.31 | 2437 | 18 |
| 274.073883 | 41.64 | 57.99 | 44.17 | 93.53 | 4158 | 18 |
| 274.145691 | 36.69 | 55.86 | 41.58 | 85.82 | 4071 | 27 |
| 274.216034 | 37.98 | 45.87 | 37.07 | 76.38 | 4203 | 27 |
| 274.285797 | 40.02 | 62.38 | 44.12 | 94.31 | 4332 | 56 |
| 274.356018 | 29.38 | 57.31 | 40.33 | 85.87 | 4418 | 56 |
| 274.426483 | 18.87 | 54.01 | 38.87 | 77.40 | 4367 | 48 |
| 274.497162 | 17.22 | 68.25 | 57.76 | 99.34 | 4258 | 48 |
| 274.569458 | 25.21 | 75.68 | 45.36 | 103.99 | 4374 | 67 |
| 274.640411 | 23.25 | 70.53 | 36.07 | 93.19 | 4173 | 48 |
| 274.709961 | 23.51 | 63.67 | 25.18 | 83.34 | 4073 | 48 |
| 274.780365 | 24.86 | 51.07 | 21.11 | 68.95 | 4250 | 48 |
| 274.851562 | 30.64 | 77.72 | 53.85 | 115.55 | 4344 | 48 |
| 274.923401 | 44.52 | 84.17 | 64.06 | 130.36 | 4562 | 94 |
| 274.980835 | 40.39 | 69.50 | 31.55 | 95.42 | 2815 | 94 |
| 275.016876 | 48.48 | 38.84 | 16.23 | 71.04 | 1636 | 27 |
| 275.063965 | 39.60 | 54.49 | 26.37 | 80.11 | 4220 | 27 |
| 275.136047 | 35.83 | 55.18 | 34.31 | 81.43 | 4053 | 22 |
| 275.206482 | 39.23 | 46.24 | 31.78 | 75.23 | 4180 | 22 |
| 275.276306 | 40.88 | 43.66 | 27.03 | 71.17 | 4319 | 18 |
| 275.346405 | 28.57 | 44.24 | 22.95 | 63.47 | 4394 | 18 |
| 275.416901 | 21.60 | 41.70 | 24.68 | 59.17 | 4384 | 7 |
| 275.487549 | 22.27 | 45.85 | 32.01 | 66.34 | 4269 | 7 |
| 275.559723 | 25.87 | 51.36 | 26.90 | 71.13 | 4374 | 6 |
| 275.630798 | 25.00 | 53.58 | 21.80 | 70.89 | 4209 | 12 |
| 275.700867 | 19.19 | 48.86 | 24.10 | 62.75 | 3937 | 12 |
| 275.770752 | 22.31 | 45.64 | 29.14 | 65.61 | 4234 | 6 |
| 275.841766 | 26.66 | 44.15 | 25.07 | 63.59 | 4289 | 6 |
| 275.913574 | 36.55 | 42.06 | 30.54 | 71.28 | 4517 | 4 |
| 275.973969 | 40.22 | 43.41 | 31.16 | 75.53 | 3210 | 4 |
| 276.010345 | 37.26 | 32.30 | 8.92 | 53.87 | 1200 | 2 |
| 276.053101 | 39.81 | 48.68 | 28.54 | 76.92 | 4235 | 2 |
| 276.125427 | 38.70 | 47.65 | 29.53 | 75.52 | 4036 | 4 |
| 276.195923 | 37.27 | 42.51 | 23.91 | 68.00 | 4149 | 4 |
| 276.265839 | 37.64 | 39.82 | 18.00 | 62.42 | 4309 | 5 |
| 276.335846 | 26.77 | 41.38 | 22.87 | 60.72 | 4378 | 5 |
| 276.406342 | 20.17 | 36.26 | 25.68 | 53.45 | 4397 | 6 |
| 276.476898 | 19.38 | 35.30 | 30.18 | 57.88 | 4291 | 6 |
| 276.548981 | 22.80 | 45.94 | 29.04 | 66.58 | 4389 | 9 |
| 276.620239 | 24.22 | 55.09 | 29.11 | 73.05 | 4242 | 9 |
| 276.690369 | 21.66 | 56.59 | 43.59 | 88.03 | 3969 | 32 |
| 276.760132 | 22.54 | 50.75 | 30.14 | 72.75 | 4226 | 9 |
| 276.831116 | 25.26 | 49.72 | 27.96 | 70.24 | 4286 | 9 |
| 276.902893 | 33.71 | 54.67 | 36.32 | 82.15 | 4519 | 12 |
| 276.968536 | 40.46 | 50.93 | 41.76 | 88.52 | 3828 | 12 |
| 278.035309 | 45.18 | 49.30 | 30.64 | 83.01 | 4182 | 32 |
| 278.106140 | 42.66 | 53.48 | 32.75 | 83.77 | 4021 | 32 |
| 278.176819 | 37.18 | 50.12 | 33.74 | 77.82 | 4115 | 39 |
| 278.246887 | 38.02 | 46.53 | 32.23 | 75.03 | 4256 | 39 |
| 278.316711 | 30.95 | 56.98 | 44.16 | 88.54 | 4362 | 48 |
| 278.387146 | 26.06 | 64.81 | 40.87 | 89.03 | 4408 | 27 |
| 278.457703 | 18.82 | 64.57 | 37.54 | 86.75 | 4319 | 27 |
| 278.529327 | 25.21 | 84.52 | 55.79 | 118.56 | 4359 | 56 |
| 278.600861 | 28.84 | 104.64 | 80.14 | 158.75 | 4300 | 56 |
| 278.671631 | 34.98 | 112.37 | 54.69 | 147.13 | 4110 | 27 |

| | | | | | | |
|------------|-------|--------|--------|--------|------|-----|
| 278.740936 | 38.76 | 139.89 | 65.36 | 178.34 | 4180 | 27 |
| 278.811707 | 44.37 | 142.81 | 71.23 | 187.20 | 4277 | 5 |
| 278.883575 | 47.32 | 108.60 | 86.63 | 172.59 | 4499 | 7 |
| 278.955109 | 56.01 | 103.09 | 61.07 | 149.30 | 4621 | 7 |
| 278.993622 | 48.43 | 115.20 | 23.10 | 137.03 | 687 | 7 |
| 279.031219 | 57.65 | 103.01 | 47.58 | 142.34 | 3653 | 7 |
| 279.096466 | 52.37 | 96.32 | 51.05 | 134.12 | 4021 | 7 |
| 279.167297 | 43.58 | 92.37 | 72.13 | 140.38 | 4095 | 18 |
| 279.235260 | 58.72 | 138.45 | 109.06 | 201.35 | 3828 | 18 |
| 279.307251 | 48.19 | 133.21 | 78.75 | 173.81 | 4380 | 48 |
| 279.377533 | 41.06 | 106.54 | 45.92 | 131.29 | 4419 | 48 |
| 279.448120 | 28.01 | 86.16 | 34.45 | 105.85 | 4331 | 48 |
| 279.517731 | 36.61 | 146.52 | 87.81 | 191.25 | 4102 | 94 |
| 279.591888 | 47.44 | 160.40 | 80.21 | 201.88 | 4240 | 94 |
| 279.662048 | 57.26 | 127.39 | 57.74 | 166.18 | 4140 | 67 |
| 279.731323 | 53.60 | 121.03 | 45.34 | 152.53 | 4154 | 67 |
| 279.802002 | 55.25 | 112.58 | 31.95 | 145.04 | 4284 | 154 |
| 279.873901 | 57.05 | 115.36 | 53.65 | 155.83 | 4432 | 154 |
| 279.945282 | 57.98 | 92.07 | 47.27 | 131.58 | 4623 | 67 |
| 279.986359 | 69.21 | 76.07 | 18.58 | 118.92 | 917 | 67 |
| 280.023407 | 51.14 | 82.56 | 41.85 | 115.86 | 3376 | 56 |
| 280.085663 | 49.79 | 79.48 | 35.47 | 110.16 | 4026 | 56 |
| 280.156647 | 45.83 | 68.63 | 29.81 | 96.89 | 4096 | 111 |
| 280.226807 | 48.41 | 59.99 | 28.66 | 91.22 | 4217 | 111 |
| 280.294861 | 48.20 | 53.14 | 22.99 | 82.20 | 4134 | 179 |
| 280.367096 | 36.54 | 52.15 | 24.43 | 76.92 | 4405 | 179 |
| 280.437561 | 27.66 | 53.46 | 25.01 | 71.95 | 4350 | 154 |
| 280.508331 | 26.00 | 52.66 | 30.62 | 72.97 | 4195 | 179 |
| 280.580475 | 27.80 | 62.17 | 20.94 | 78.80 | 4343 | 179 |
| 280.651428 | 28.51 | 59.35 | 16.50 | 74.58 | 4165 | 111 |
| 280.720764 | 28.03 | 56.06 | 18.51 | 74.64 | 4115 | 111 |
| 280.791351 | 31.69 | 52.74 | 23.29 | 75.18 | 4269 | 94 |
| 280.862915 | 37.64 | 48.87 | 19.64 | 72.90 | 4443 | 94 |
| 280.934540 | 46.25 | 47.65 | 25.64 | 78.76 | 4603 | 48 |
| 280.985046 | 48.30 | 43.00 | 29.21 | 80.21 | 1870 | 48 |
| 281.019348 | 43.55 | 49.42 | 25.88 | 77.85 | 2498 | 12 |
| 281.075165 | 45.43 | 55.33 | 31.06 | 85.42 | 4137 | 12 |
| 281.147003 | 41.97 | 55.83 | 29.57 | 82.18 | 4066 | 3 |
| 281.217346 | 40.08 | 47.30 | 28.66 | 75.09 | 4204 | 3 |
| 281.287170 | 42.35 | 46.78 | 18.47 | 71.05 | 4344 | 3 |
| 281.357330 | 30.88 | 39.13 | 20.89 | 60.31 | 4418 | 3 |
| 281.427795 | 22.29 | 38.66 | 23.42 | 56.45 | 4364 | 2 |
| 281.498505 | 22.49 | 42.35 | 33.27 | 65.98 | 4257 | 2 |
| 281.570801 | 25.71 | 60.23 | 29.19 | 78.95 | 4365 | 4 |
| 281.641785 | 25.20 | 55.99 | 22.52 | 71.84 | 4185 | 2 |
| 281.711243 | 23.93 | 49.56 | 24.26 | 68.13 | 4088 | 2 |
| 281.781738 | 27.16 | 47.46 | 28.64 | 70.81 | 4256 | 4 |
| 281.852600 | 30.19 | 45.22 | 27.98 | 69.48 | 4292 | 4 |
| 281.924805 | 39.42 | 44.35 | 29.81 | 74.64 | 4583 | 3 |
| 281.981384 | 40.33 | 49.67 | 35.03 | 81.87 | 2698 | 3 |
| 282.017059 | 42.30 | 33.94 | 14.70 | 61.17 | 1749 | 0 |
| 282.065277 | 41.34 | 52.74 | 31.43 | 80.66 | 4214 | 0 |
| 282.137360 | 40.25 | 51.54 | 31.97 | 80.09 | 4052 | 4 |
| 282.207794 | 36.57 | 42.02 | 27.94 | 68.71 | 4186 | 4 |
| 282.277649 | 39.38 | 38.41 | 16.53 | 62.64 | 4323 | 5 |
| 282.347717 | 27.28 | 36.70 | 18.60 | 56.01 | 4401 | 5 |
| 282.418213 | 22.20 | 34.09 | 19.57 | 51.72 | 4379 | 4 |
| 282.488861 | 21.86 | 35.63 | 24.45 | 56.05 | 4254 | 4 |
| 282.561096 | 24.36 | 46.89 | 20.71 | 63.45 | 4388 | 9 |
| 282.632202 | 23.49 | 49.98 | 21.61 | 65.69 | 4214 | 6 |
| 282.702423 | 18.51 | 43.55 | 16.06 | 54.10 | 3913 | 6 |
| 282.772003 | 22.65 | 41.62 | 22.59 | 59.94 | 4221 | 6 |
| 282.843140 | 25.55 | 42.48 | 22.23 | 60.58 | 4300 | 6 |
| 282.915131 | 35.66 | 45.62 | 32.96 | 74.58 | 4480 | 0 |
| 282.975677 | 39.95 | 50.50 | 37.26 | 82.34 | 3153 | 0 |
| 283.012085 | 38.92 | 35.20 | 9.00 | 57.21 | 1252 | 0 |
| 283.055969 | 39.35 | 50.13 | 26.36 | 75.21 | 4176 | 0 |
| 283.127869 | 36.38 | 47.71 | 25.67 | 71.82 | 4030 | 2 |
| 283.198273 | 34.95 | 40.43 | 25.86 | 65.68 | 4160 | 2 |
| 283.268158 | 37.60 | 38.41 | 18.98 | 61.75 | 4318 | 2 |
| 283.338104 | 25.96 | 36.01 | 20.16 | 55.36 | 4384 | 2 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|-----|
| 283.408600 | 21.16 | 34.36 | 19.82 | 50.27 | 4391 | 2 |
| 283.479248 | 20.31 | 32.90 | 26.06 | 54.34 | 4287 | 2 |
| 283.551300 | 23.39 | 45.74 | 21.45 | 62.70 | 4390 | 2 |
| 283.622528 | 23.22 | 49.76 | 22.47 | 65.07 | 4245 | 2 |
| 283.692688 | 19.32 | 43.95 | 21.51 | 57.58 | 3960 | 2 |
| 283.762451 | 23.00 | 41.97 | 25.37 | 61.71 | 4225 | 3 |
| 283.833435 | 24.30 | 40.82 | 22.88 | 60.34 | 4290 | 3 |
| 283.905151 | 29.84 | 44.67 | 27.80 | 67.00 | 4522 | 7 |
| 283.969452 | 33.65 | 48.64 | 32.28 | 73.96 | 3637 | 7 |
| 284.004517 | 40.92 | 33.61 | 15.18 | 58.89 | 773 | 3 |
| 284.044708 | 33.20 | 50.76 | 29.64 | 75.14 | 4256 | 3 |
| 284.117126 | 32.97 | 48.38 | 32.11 | 74.32 | 4019 | 3 |
| 284.187683 | 28.57 | 45.24 | 30.33 | 67.18 | 4125 | 2 |
| 284.257660 | 32.99 | 41.98 | 29.10 | 65.91 | 4277 | 2 |
| 284.327606 | 24.67 | 42.97 | 22.02 | 60.09 | 4365 | 2 |
| 284.398102 | 18.29 | 42.50 | 31.26 | 62.14 | 4402 | 2 |
| 284.468658 | 17.95 | 40.03 | 25.43 | 56.57 | 4302 | 2 |
| 284.540527 | 21.43 | 46.50 | 28.18 | 64.84 | 4383 | 4 |
| 284.611877 | 21.77 | 54.88 | 29.04 | 71.78 | 4265 | 4 |
| 284.682465 | 19.20 | 50.31 | 24.70 | 65.81 | 4062 | 4 |
| 284.751892 | 24.42 | 43.39 | 22.96 | 62.69 | 4204 | 6 |
| 284.823212 | 24.15 | 42.71 | 26.74 | 63.14 | 4222 | 6 |
| 284.894592 | 27.61 | 46.39 | 29.21 | 67.41 | 4514 | 7 |
| 284.965881 | 35.09 | 46.51 | 25.46 | 69.76 | 4524 | 7 |
| 285.035950 | 30.37 | 53.40 | 32.83 | 77.68 | 4234 | 7 |
| 285.107452 | 32.20 | 50.61 | 46.44 | 85.62 | 4019 | 7 |
| 285.178131 | 26.47 | 51.62 | 45.98 | 83.10 | 4116 | 9 |
| 285.248230 | 30.59 | 45.52 | 42.05 | 77.35 | 4264 | 9 |
| 285.317963 | 22.28 | 41.43 | 22.72 | 58.77 | 4353 | 15 |
| 285.388580 | 18.84 | 36.57 | 21.45 | 52.39 | 4415 | 9 |
| 285.459015 | 17.49 | 37.96 | 22.46 | 52.93 | 4327 | 9 |
| 285.530670 | 21.23 | 48.80 | 37.45 | 74.60 | 4360 | 6 |
| 285.602234 | 21.68 | 51.75 | 22.72 | 67.56 | 4300 | 6 |
| 285.672974 | 18.55 | 48.76 | 17.02 | 60.74 | 4110 | 7 |
| 285.742249 | 28.00 | 46.95 | 28.73 | 69.81 | 4187 | 7 |
| 285.813080 | 28.15 | 52.08 | 33.99 | 76.78 | 4276 | 4 |
| 285.884979 | 27.10 | 48.03 | 36.92 | 74.10 | 4493 | 7 |
| 285.955780 | 34.06 | 48.01 | 29.99 | 74.26 | 4535 | 7 |
| 285.995422 | 25.11 | 44.65 | 24.47 | 60.38 | 573 | 7 |
| 286.032745 | 40.52 | 47.87 | 35.35 | 81.54 | 3652 | 27 |
| 286.097839 | 39.14 | 47.57 | 34.04 | 78.10 | 4023 | 27 |
| 286.168518 | 33.22 | 47.12 | 31.06 | 71.92 | 4090 | 39 |
| 286.238983 | 37.12 | 39.86 | 25.25 | 64.39 | 4157 | 39 |
| 286.308594 | 31.31 | 39.35 | 18.51 | 59.03 | 4383 | 9 |
| 286.378876 | 23.38 | 36.72 | 22.04 | 54.45 | 4407 | 6 |
| 286.449463 | 19.67 | 34.65 | 24.50 | 52.75 | 4320 | 6 |
| 286.520538 | 23.51 | 39.75 | 26.73 | 60.43 | 4296 | 12 |
| 286.592560 | 24.72 | 49.80 | 26.00 | 68.73 | 4328 | 12 |
| 286.663391 | 21.39 | 47.66 | 22.75 | 62.99 | 4137 | 5 |
| 286.732635 | 19.81 | 42.28 | 24.12 | 58.37 | 4161 | 5 |
| 286.803375 | 23.63 | 41.62 | 26.88 | 61.01 | 4283 | 18 |
| 286.875031 | 27.12 | 41.08 | 32.41 | 65.49 | 4493 | 4 |
| 286.946655 | 36.83 | 47.13 | 31.14 | 75.62 | 4620 | 4 |
| 286.987762 | 38.38 | 60.73 | 37.26 | 84.28 | 925 | 4 |
| 287.024353 | 34.01 | 62.09 | 43.88 | 95.17 | 3408 | 9 |
| 287.087067 | 35.31 | 61.16 | 58.02 | 106.31 | 4022 | 9 |
| 287.157990 | 31.48 | 76.24 | 60.84 | 114.64 | 4099 | 4 |
| 287.298065 | 30.41 | 46.60 | 43.11 | 79.25 | 4364 | 4 |
| 287.368347 | 20.92 | 42.62 | 45.89 | 72.85 | 4416 | 4 |
| 287.438843 | 19.46 | 37.13 | 48.26 | 70.97 | 4342 | 5 |
| 287.509491 | 20.68 | 40.70 | 46.35 | 71.81 | 4228 | 6 |
| 287.581879 | 21.90 | 54.13 | 41.12 | 79.62 | 4351 | 6 |
| 287.652802 | 21.75 | 47.16 | 41.82 | 75.11 | 4160 | 4 |
| 287.722137 | 23.81 | 48.96 | 43.22 | 81.19 | 4126 | 4 |
| 287.792755 | 26.08 | 47.07 | 41.59 | 79.06 | 4266 | 4 |
| 287.864288 | 26.19 | 47.75 | 40.62 | 78.96 | 4452 | 4 |
| 287.935974 | 35.66 | 56.48 | 48.23 | 94.01 | 4604 | 15 |
| 287.985474 | 39.71 | 55.26 | 54.16 | 96.49 | 1750 | 15 |
| 288.020233 | 35.87 | 59.27 | 44.78 | 95.98 | 2680 | 80 |
| 288.076569 | 35.18 | 60.38 | 43.66 | 93.66 | 4132 | 80 |
| 288.148376 | 27.74 | 61.95 | 46.50 | 93.01 | 4072 | 111 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 288.288727 | 34.79 | 73.09 | 58.96 | 115.50 | 4315 | 15 |
| 288.358734 | 21.75 | 65.80 | 44.95 | 96.96 | 4407 | 15 |
| 288.429199 | 20.63 | 78.68 | 51.56 | 109.43 | 4373 | 9 |
| 288.499817 | 17.91 | 76.89 | 59.42 | 110.59 | 4245 | 9 |
| 288.572174 | 27.32 | 109.56 | 55.74 | 142.69 | 4362 | 27 |
| 288.643127 | 26.38 | 95.81 | 49.69 | 125.49 | 4180 | 27 |
| 288.712616 | 31.16 | 93.13 | 59.52 | 129.85 | 4090 | 27 |
| 288.783081 | 33.47 | 70.47 | 62.20 | 112.66 | 4241 | 15 |
| 288.854462 | 31.40 | 58.02 | 43.51 | 93.61 | 4374 | 15 |
| 288.926239 | 38.28 | 66.20 | 48.33 | 105.39 | 4598 | 6 |
| 288.981964 | 41.31 | 69.60 | 48.02 | 109.25 | 2590 | 6 |
| 289.017303 | 36.27 | 54.62 | 16.12 | 72.75 | 1867 | 22 |
| 289.066681 | 38.33 | 57.18 | 32.65 | 83.86 | 4215 | 22 |
| 289.138733 | 33.70 | 54.70 | 38.39 | 83.65 | 4056 | 39 |
| 289.209106 | 32.29 | 45.94 | 28.34 | 70.21 | 4179 | 39 |
| 289.279053 | 34.44 | 43.01 | 18.25 | 63.42 | 4336 | 67 |
| 289.349121 | 23.16 | 40.26 | 20.20 | 57.59 | 4394 | 67 |
| 289.419586 | 17.98 | 39.31 | 19.79 | 53.59 | 4379 | 48 |
| 289.490234 | 20.85 | 44.09 | 24.05 | 59.70 | 4259 | 48 |
| 289.562439 | 24.18 | 55.00 | 20.59 | 69.39 | 4377 | 48 |
| 289.633575 | 21.57 | 51.54 | 19.93 | 64.78 | 4216 | 56 |
| 289.703400 | 18.37 | 47.16 | 24.80 | 64.03 | 3979 | 56 |
| 289.773499 | 28.09 | 48.84 | 23.50 | 68.21 | 4238 | 32 |
| 289.844482 | 26.04 | 44.17 | 25.90 | 65.88 | 4291 | 32 |
| 289.916260 | 31.08 | 49.88 | 30.31 | 74.32 | 4527 | 48 |
| 289.975830 | 35.04 | 52.80 | 31.79 | 79.66 | 3079 | 48 |
| 290.012390 | 30.83 | 42.24 | 17.00 | 59.12 | 1359 | 7 |
| 290.056885 | 32.49 | 63.22 | 40.77 | 92.54 | 4238 | 7 |
| 290.129028 | 32.32 | 55.84 | 26.21 | 76.47 | 3451 | 15 |
| 290.199646 | 30.46 | 41.92 | 22.76 | 63.54 | 4151 | 15 |
| 290.269531 | 33.36 | 39.86 | 18.20 | 60.73 | 4302 | 6 |
| 290.339478 | 23.11 | 40.23 | 16.99 | 56.37 | 4388 | 6 |
| 290.409973 | 16.81 | 38.59 | 21.58 | 52.92 | 4392 | 6 |
| 290.480621 | 19.07 | 37.25 | 23.55 | 53.88 | 4283 | 6 |
| 290.552704 | 23.23 | 46.97 | 20.82 | 61.95 | 4391 | 7 |
| 290.623993 | 22.74 | 49.17 | 20.63 | 64.64 | 4244 | 7 |
| 290.694061 | 17.25 | 47.42 | 24.08 | 61.17 | 3958 | 6 |
| 290.763824 | 25.71 | 46.07 | 30.51 | 69.40 | 4225 | 7 |
| 290.834747 | 25.70 | 43.18 | 25.86 | 65.14 | 4293 | 7 |
| 290.910675 | 32.63 | 50.61 | 31.65 | 77.39 | 3992 | 7 |
| 290.969666 | 35.44 | 45.65 | 29.10 | 72.91 | 3524 | 7 |
| 291.005219 | 39.04 | 30.79 | 11.11 | 54.40 | 892 | 32 |
| 291.046082 | 35.62 | 52.48 | 32.72 | 78.82 | 4252 | 32 |
| 291.118530 | 35.19 | 51.72 | 45.27 | 84.49 | 4019 | 32 |
| 291.189087 | 30.26 | 45.35 | 28.58 | 67.25 | 4142 | 7 |
| 291.259094 | 33.67 | 37.95 | 20.44 | 59.38 | 4292 | 5 |
| 291.328949 | 25.50 | 38.25 | 18.02 | 54.85 | 4359 | 5 |
| 291.399384 | 19.13 | 34.00 | 22.54 | 51.01 | 4397 | 5 |
| 291.470001 | 18.34 | 33.90 | 23.64 | 51.90 | 4303 | 5 |
| 291.541931 | 22.12 | 46.48 | 23.21 | 63.07 | 4387 | 6 |
| 291.611542 | 24.52 | 51.31 | 21.92 | 66.57 | 3849 | 6 |
| 291.683838 | 30.98 | 45.75 | 18.19 | 64.38 | 4056 | 12 |
| 291.753204 | 23.37 | 40.32 | 25.11 | 60.00 | 4209 | 7 |
| 291.824158 | 26.62 | 39.42 | 38.08 | 71.26 | 4283 | 7 |
| 291.895935 | 36.40 | 41.31 | 33.92 | 74.53 | 4511 | 7 |
| 291.966217 | 41.57 | 47.46 | 30.78 | 77.95 | 4428 | 7 |
| 292.000336 | 47.89 | 68.89 | 17.93 | 85.96 | 57 | 15 |
| 292.036407 | 49.04 | 49.86 | 32.42 | 86.00 | 4313 | 15 |
| 292.108856 | 47.71 | 52.09 | 33.86 | 86.98 | 4020 | 15 |
| 292.179535 | 39.09 | 48.68 | 31.01 | 77.01 | 4121 | 15 |
| 292.249542 | 42.85 | 39.90 | 23.45 | 69.42 | 4268 | 15 |
| 292.319397 | 36.40 | 38.74 | 16.95 | 61.65 | 4352 | 7 |
| 292.389862 | 28.43 | 36.51 | 22.67 | 57.40 | 4422 | 7 |
| 292.460358 | 26.99 | 34.95 | 29.67 | 60.70 | 4320 | 7 |
| 292.532074 | 29.88 | 44.49 | 35.96 | 73.10 | 4363 | 7 |
| 292.603577 | 26.31 | 53.83 | 26.08 | 72.25 | 4294 | 7 |
| 292.674286 | 29.02 | 47.96 | 20.83 | 66.52 | 4107 | 7 |
| 292.743591 | 22.21 | 40.13 | 27.42 | 60.60 | 4192 | 7 |
| 292.814453 | 26.22 | 41.48 | 25.49 | 63.54 | 4274 | 15 |
| 292.886322 | 32.60 | 46.45 | 34.49 | 74.96 | 4492 | 12 |
| 292.957825 | 42.70 | 47.78 | 30.91 | 79.24 | 4633 | 12 |

| | | | | | | |
|------------|-------|-------|-------|--------|------|----|
| 292.996185 | 25.62 | 41.14 | 23.06 | 59.27 | 654 | 12 |
| 293.033752 | 48.58 | 50.92 | 28.99 | 84.35 | 3675 | 15 |
| 293.099182 | 45.39 | 53.56 | 33.85 | 86.32 | 4024 | 15 |
| 293.169952 | 36.14 | 48.53 | 28.40 | 73.34 | 4103 | 9 |
| 293.240082 | 40.64 | 41.10 | 20.04 | 66.80 | 4253 | 9 |
| 293.309937 | 35.32 | 41.83 | 17.93 | 63.76 | 4367 | 6 |
| 293.380280 | 28.07 | 36.81 | 19.63 | 55.67 | 4421 | 7 |
| 293.450836 | 21.85 | 36.50 | 21.50 | 53.92 | 4316 | 7 |
| 293.522064 | 23.57 | 42.79 | 27.53 | 63.69 | 4314 | 12 |
| 293.593994 | 24.79 | 52.25 | 22.34 | 68.84 | 4298 | 12 |
| 293.664764 | 26.12 | 48.59 | 21.63 | 66.73 | 4134 | 6 |
| 293.733978 | 21.65 | 41.70 | 25.60 | 59.95 | 4163 | 6 |
| 293.804749 | 25.11 | 42.07 | 26.11 | 62.77 | 4285 | 6 |
| 293.876465 | 24.76 | 38.34 | 31.40 | 61.94 | 4493 | 12 |
| 293.948059 | 32.91 | 41.25 | 25.56 | 65.60 | 4623 | 12 |
| 293.989136 | 42.96 | 46.16 | 35.73 | 79.33 | 925 | 12 |
| 294.026306 | 32.74 | 45.29 | 25.32 | 68.94 | 3466 | 12 |
| 294.089508 | 31.95 | 47.64 | 37.59 | 77.72 | 4018 | 12 |
| 294.160370 | 28.75 | 47.36 | 34.83 | 72.89 | 4089 | 12 |
| 294.300385 | 26.27 | 36.62 | 43.30 | 68.26 | 4360 | 9 |
| 294.370636 | 18.25 | 33.61 | 45.39 | 64.59 | 4417 | 9 |
| 294.441162 | 16.67 | 34.49 | 47.33 | 65.94 | 4341 | 7 |
| 294.511841 | 18.65 | 40.55 | 45.60 | 70.54 | 4226 | 15 |
| 294.584198 | 22.86 | 50.14 | 42.43 | 76.94 | 4341 | 15 |
| 294.655151 | 20.85 | 47.29 | 41.71 | 73.03 | 4155 | 5 |
| 294.724457 | 21.96 | 41.80 | 45.38 | 74.70 | 4145 | 5 |
| 294.795105 | 26.38 | 41.16 | 42.91 | 76.09 | 4267 | 5 |
| 294.866547 | 25.29 | 41.97 | 40.57 | 72.83 | 4447 | 5 |
| 294.938171 | 29.70 | 43.43 | 41.49 | 76.37 | 4587 | 7 |
| 294.986328 | 35.53 | 51.10 | 58.01 | 94.68 | 1573 | 7 |
| 295.020691 | 28.02 | 46.90 | 24.34 | 67.33 | 2796 | 3 |
| 295.078156 | 31.22 | 48.25 | 36.43 | 76.96 | 4126 | 3 |
| 295.149719 | 25.54 | 48.28 | 36.00 | 72.43 | 4076 | 4 |
| 295.289948 | 25.51 | 36.64 | 40.68 | 66.19 | 4348 | 2 |
| 295.360138 | 18.17 | 34.63 | 40.99 | 62.79 | 4413 | 2 |
| 295.430573 | 16.13 | 35.10 | 44.76 | 64.17 | 4368 | 3 |
| 295.501221 | 19.73 | 39.05 | 45.45 | 69.38 | 4252 | 2 |
| 295.573547 | 23.74 | 51.87 | 39.44 | 78.31 | 4361 | 2 |
| 295.644501 | 22.42 | 46.80 | 40.67 | 73.15 | 4179 | 3 |
| 295.713959 | 22.73 | 42.89 | 41.94 | 74.25 | 4088 | 3 |
| 295.784485 | 28.58 | 41.21 | 45.22 | 78.61 | 4257 | 4 |
| 295.855896 | 24.66 | 41.06 | 42.88 | 72.46 | 4380 | 4 |
| 295.927612 | 27.63 | 42.55 | 42.92 | 74.91 | 4597 | 2 |
| 295.982513 | 30.06 | 51.05 | 40.33 | 81.61 | 2475 | 2 |
| 296.017670 | 29.55 | 36.08 | 18.48 | 59.07 | 1978 | 2 |
| 296.068115 | 29.32 | 46.51 | 29.58 | 70.43 | 4202 | 2 |
| 296.140137 | 25.19 | 46.69 | 28.73 | 68.31 | 4058 | 0 |
| 296.210510 | 27.48 | 39.25 | 20.53 | 58.08 | 4185 | 0 |
| 296.280457 | 24.66 | 39.46 | 14.73 | 53.04 | 4331 | 2 |
| 296.350555 | 16.92 | 40.82 | 19.61 | 51.49 | 4392 | 2 |
| 296.420959 | 16.37 | 35.90 | 17.77 | 47.81 | 4374 | 3 |
| 296.491608 | 19.59 | 38.35 | 27.32 | 57.91 | 4254 | 3 |
| 296.563873 | 24.83 | 48.50 | 33.10 | 72.63 | 4381 | 6 |
| 296.634918 | 23.06 | 48.94 | 34.08 | 71.47 | 4214 | 5 |
| 296.704651 | 23.60 | 48.74 | 34.05 | 73.17 | 4003 | 5 |
| 296.774902 | 36.82 | 64.37 | 60.25 | 110.97 | 4226 | 4 |
| 296.845886 | 26.02 | 60.61 | 39.11 | 89.35 | 4295 | 4 |
| 296.916809 | 31.71 | 53.32 | 34.67 | 80.72 | 4370 | 2 |
| 296.975983 | 33.18 | 59.39 | 44.75 | 92.57 | 2932 | 2 |
| 297.012695 | 42.69 | 50.92 | 34.42 | 83.38 | 1485 | 3 |
| 297.058258 | 36.52 | 55.93 | 36.54 | 85.62 | 4234 | 3 |
| 297.130493 | 31.53 | 48.42 | 31.52 | 73.62 | 4031 | 3 |
| 297.201019 | 32.12 | 42.09 | 29.31 | 66.23 | 4143 | 3 |
| 297.270935 | 33.52 | 49.69 | 35.50 | 77.20 | 4313 | 7 |
| 297.340881 | 26.06 | 43.31 | 26.34 | 63.94 | 4377 | 7 |
| 297.411530 | 19.04 | 41.64 | 28.19 | 59.07 | 4354 | 15 |
| 297.481964 | 19.71 | 41.85 | 30.51 | 62.09 | 4280 | 15 |
| 297.554077 | 24.78 | 47.09 | 25.68 | 66.38 | 4384 | 18 |
| 297.625336 | 22.07 | 51.03 | 22.43 | 66.31 | 4247 | 39 |
| 297.695526 | 18.11 | 48.18 | 20.14 | 59.69 | 3936 | 39 |
| 297.765198 | 26.10 | 45.13 | 25.07 | 64.84 | 4229 | 32 |

| | | | | | | |
|------------|--------|--------|-------|--------|------|----|
| 297.836151 | 24.88 | 42.38 | 26.97 | 63.80 | 4288 | 32 |
| 297.907928 | 33.66 | 46.23 | 34.80 | 74.07 | 4524 | 12 |
| 297.970001 | 42.45 | 50.44 | 37.48 | 85.01 | 3404 | 12 |
| 298.005920 | 42.31 | 31.47 | 9.97 | 56.76 | 1008 | 27 |
| 298.047485 | 42.06 | 55.94 | 32.17 | 85.02 | 4247 | 27 |
| 298.119873 | 40.44 | 51.29 | 33.70 | 81.59 | 4012 | 27 |
| 298.190460 | 35.65 | 43.13 | 27.24 | 68.65 | 4136 | 18 |
| 298.260468 | 38.17 | 41.93 | 19.47 | 64.43 | 4296 | 22 |
| 298.330383 | 28.49 | 42.64 | 22.38 | 62.46 | 4364 | 22 |
| 298.400818 | 21.23 | 40.51 | 33.86 | 61.93 | 4402 | 22 |
| 298.471375 | 18.65 | 44.07 | 43.81 | 71.86 | 4294 | 22 |
| 298.543335 | 25.73 | 54.10 | 37.33 | 78.85 | 4387 | 9 |
| 298.614655 | 23.48 | 54.04 | 22.81 | 69.77 | 4266 | 9 |
| 298.685211 | 24.67 | 48.55 | 19.06 | 63.24 | 4047 | 6 |
| 298.754608 | 23.54 | 43.79 | 28.68 | 64.68 | 4211 | 7 |
| 298.825531 | 24.34 | 43.84 | 28.69 | 65.49 | 4284 | 7 |
| 298.897278 | 32.37 | 46.12 | 35.00 | 74.53 | 4520 | 9 |
| 298.966705 | 40.38 | 46.11 | 32.60 | 78.53 | 4302 | 9 |
| 299.001068 | 43.69 | 66.58 | 23.18 | 83.32 | 176 | 9 |
| 299.037720 | 42.93 | 51.42 | 35.12 | 85.36 | 4283 | 9 |
| 299.110260 | 40.47 | 51.05 | 42.08 | 87.30 | 4021 | 9 |
| 299.180908 | 33.79 | 44.88 | 36.19 | 75.03 | 4123 | 6 |
| 299.250946 | 37.00 | 40.38 | 43.10 | 77.24 | 4276 | 9 |
| 299.320740 | 29.38 | 41.69 | 39.62 | 72.75 | 4347 | 9 |
| 299.391235 | 22.49 | 36.82 | 45.67 | 70.17 | 4409 | 18 |
| 299.461761 | 17.47 | 39.83 | 43.35 | 69.81 | 4330 | 18 |
| 299.533508 | 25.90 | 50.16 | 52.37 | 85.13 | 4366 | 12 |
| 299.604980 | 25.74 | 53.01 | 45.59 | 84.05 | 4293 | 12 |
| 299.675690 | 24.67 | 47.02 | 37.43 | 74.73 | 4097 | 5 |
| 299.823395 | 26.11 | 44.80 | 30.08 | 70.45 | 3409 | 6 |
| 299.887787 | 29.22 | 43.36 | 45.35 | 79.93 | 4492 | 6 |
| 299.959167 | 38.60 | 48.22 | 45.11 | 86.57 | 4621 | 6 |
| 299.996857 | 23.08 | 44.05 | 74.25 | 98.30 | 532 | 6 |
| 300.033997 | 44.37 | 51.05 | 34.31 | 84.67 | 3770 | 2 |
| 300.100708 | 40.50 | 51.61 | 38.32 | 84.38 | 3933 | 2 |
| 300.171356 | 30.88 | 50.34 | 36.78 | 76.91 | 4109 | 3 |
| 300.241455 | 34.95 | 44.97 | 28.11 | 69.03 | 4250 | 3 |
| 300.311340 | 29.46 | 45.44 | 21.70 | 64.60 | 4370 | 7 |
| 300.381653 | 21.64 | 39.04 | 23.94 | 56.73 | 4419 | 7 |
| 300.452209 | 17.82 | 38.97 | 24.58 | 55.70 | 4312 | 7 |
| 300.523499 | 23.09 | 47.67 | 33.08 | 69.38 | 4326 | 12 |
| 300.595367 | 25.42 | 50.92 | 26.53 | 69.67 | 4331 | 12 |
| 300.666168 | 22.44 | 49.39 | 21.42 | 64.31 | 4133 | 4 |
| 300.735413 | 19.70 | 42.69 | 26.35 | 60.52 | 4171 | 4 |
| 300.806122 | 24.73 | 42.14 | 28.25 | 63.52 | 4282 | 6 |
| 300.877869 | 24.79 | 49.22 | 35.33 | 72.62 | 4498 | 7 |
| 300.949493 | 34.59 | 49.74 | 35.26 | 79.33 | 4628 | 7 |
| 300.990509 | 43.25 | 53.79 | 30.05 | 80.67 | 919 | 7 |
| 301.027649 | 33.80 | 47.92 | 32.48 | 75.93 | 3471 | 12 |
| 301.090912 | 37.04 | 49.81 | 31.24 | 78.72 | 4019 | 12 |
| 301.161774 | 40.47 | 56.85 | 31.32 | 86.17 | 4103 | 9 |
| 301.231934 | 51.52 | 83.50 | 57.68 | 131.99 | 4232 | 9 |
| 301.301849 | 136.51 | 195.01 | 43.79 | 261.85 | 4360 | 7 |
| 301.372070 | 67.47 | 89.18 | 41.21 | 139.24 | 4423 | 7 |
| 301.442566 | 20.29 | 42.70 | 42.29 | 74.21 | 4330 | 7 |
| 301.513245 | 23.10 | 45.10 | 33.23 | 67.75 | 4226 | 7 |
| 301.585663 | 26.71 | 53.07 | 19.96 | 69.57 | 4340 | 7 |
| 301.656586 | 23.63 | 50.14 | 18.94 | 64.76 | 4155 | 4 |
| 301.725830 | 23.10 | 46.90 | 19.78 | 62.33 | 4150 | 4 |
| 301.796234 | 25.62 | 49.52 | 13.60 | 63.92 | 3952 | 6 |
| 301.869049 | 31.91 | 47.95 | 13.43 | 66.18 | 4327 | 6 |
| 301.939697 | 38.55 | 47.71 | 13.99 | 70.27 | 4617 | 9 |
| 301.986694 | 34.64 | 68.89 | 24.91 | 88.07 | 1449 | 9 |
| 302.021240 | 46.82 | 42.57 | 23.88 | 75.03 | 2914 | 9 |
| 302.079529 | 44.38 | 53.73 | 25.41 | 82.16 | 4106 | 9 |
| 302.151123 | 39.12 | 52.69 | 24.70 | 78.61 | 4080 | 2 |
| 302.221527 | 37.81 | 46.11 | 26.39 | 73.78 | 4195 | 2 |
| 302.291351 | 35.45 | 47.98 | 16.09 | 67.56 | 4352 | 5 |
| 302.361511 | 25.25 | 45.24 | 17.29 | 60.77 | 4410 | 5 |
| 302.431976 | 22.06 | 48.96 | 18.08 | 61.42 | 4355 | 5 |
| 302.502625 | 22.93 | 37.32 | 22.07 | 56.13 | 4230 | 4 |

| | | | | | | |
|------------|-------|--------|-------|--------|------|----|
| 302.574951 | 28.28 | 53.68 | 28.68 | 73.24 | 4358 | 4 |
| 302.645844 | 26.12 | 48.41 | 22.50 | 66.76 | 4168 | 4 |
| 302.715302 | 26.56 | 46.15 | 22.10 | 63.91 | 4099 | 4 |
| 302.785858 | 25.89 | 48.81 | 27.37 | 68.60 | 4259 | 3 |
| 302.857361 | 24.10 | 52.52 | 19.96 | 67.46 | 4412 | 3 |
| 302.928986 | 34.03 | 64.29 | 17.53 | 81.83 | 4604 | 4 |
| 302.983063 | 42.24 | 89.13 | 29.59 | 114.69 | 2351 | 4 |
| 303.018005 | 37.09 | 118.12 | 65.88 | 151.20 | 2097 | 3 |
| 303.069580 | 44.13 | 111.86 | 59.54 | 149.83 | 4194 | 3 |
| 303.141479 | 37.59 | 100.55 | 52.38 | 129.50 | 4048 | 3 |
| 303.211884 | 36.72 | 71.62 | 50.03 | 103.35 | 4190 | 3 |
| 303.281860 | 36.72 | 75.39 | 42.41 | 102.85 | 4331 | 9 |
| 303.351898 | 26.80 | 76.74 | 32.03 | 95.75 | 4394 | 9 |
| 303.422363 | 20.85 | 75.43 | 43.57 | 99.24 | 4384 | 39 |
| 303.492950 | 21.78 | 72.97 | 23.49 | 86.93 | 4248 | 39 |
| 303.565247 | 28.62 | 66.69 | 34.59 | 92.35 | 4382 | 27 |
| 303.636292 | 27.09 | 72.59 | 38.63 | 98.21 | 4205 | 9 |
| 303.705994 | 30.19 | 75.24 | 26.32 | 96.80 | 4022 | 9 |
| 303.776245 | 31.04 | 70.40 | 36.19 | 95.64 | 4243 | 15 |
| 303.847290 | 28.47 | 62.50 | 31.90 | 84.02 | 4302 | 15 |
| 303.919006 | 36.51 | 64.73 | 23.58 | 84.47 | 4535 | 56 |
| 303.977386 | 37.74 | 67.15 | 17.77 | 85.72 | 2929 | 56 |
| 304.013794 | 41.62 | 52.32 | 51.52 | 95.90 | 1526 | 80 |
| 304.059662 | 40.81 | 69.54 | 24.87 | 90.15 | 4235 | 80 |
| 304.131927 | 38.41 | 57.24 | 29.07 | 83.41 | 4034 | 80 |
| 304.202362 | 37.93 | 49.63 | 27.78 | 74.49 | 4172 | 80 |
| 304.272308 | 39.68 | 46.67 | 26.55 | 73.62 | 4314 | 22 |
| 304.342316 | 27.26 | 50.34 | 20.86 | 67.01 | 4375 | 22 |
| 304.412750 | 22.24 | 53.12 | 25.50 | 69.63 | 4392 | 27 |
| 304.483368 | 21.55 | 47.57 | 19.46 | 60.21 | 4278 | 27 |
| 304.555481 | 22.85 | 56.78 | 27.69 | 74.31 | 4385 | 15 |
| 304.626740 | 21.57 | 61.34 | 26.39 | 76.79 | 4246 | 18 |
| 304.696808 | 16.27 | 51.22 | 18.97 | 62.02 | 3933 | 18 |
| 304.766571 | 26.22 | 47.56 | 27.72 | 70.03 | 4229 | 18 |
| 304.837616 | 27.12 | 45.25 | 27.70 | 68.66 | 4291 | 18 |
| 304.909424 | 33.18 | 48.29 | 36.00 | 78.80 | 4509 | 12 |
| 304.969879 | 38.04 | 51.73 | 40.93 | 86.61 | 3232 | 12 |

APPEBDIX F. FILES CONTAINING FRAME TIME ABNORMALITIES

NOTE: in this Section, the first minute of data in each BC data file is #1.

The BC files for Days 2000-248, 2000-249, 2000-251, 2000-265, 2000-292, and 2000-293 exhibit frame time abnormalities. This problem is not limited to data from DMSP F15. For example, it occurs in the F13 file for day 2000-197.

For example, in minute #154 of the BC file SSMF1500248 for Day 2000-248, the 36 bits 9408-9443 (enough for 4 9-bit raw words) of the data array DATAA in Subroutine UNPACK represent (in 1024ths of a second) the time of frame #32, giving a time of 9433514 1024ths of a second. However, in the following frame #33, the bits 9696-9731 produce the time of 9433100 1024ths of a second, which precedes the time for frame #32, when it should be about 1 second after the time of frame #32.

Moreover, the same quirk recurs later in minute #261. In frame #28, bits 8256-8291 produce 16003508 1024ths of a second. However, for the next frame (#29), bits 8544-8579 result in only 16003092 1024ths of a second, which precedes the time for frame #28, when it should follow the time of frame #29 by about 1 second.

Processing of Day 248 also repeated each of the following values of TS (time of second/frame). The minutes and seconds of each duplicate are also tabulated below. The second copy of each duplicated TS occurs 1 second after the first copy. In addition, since 1 second of data consists of 288 bits (32 9-bit raw words), the second copy always starts 288 bits after the first copy starts. For instance, in the first entry below, the bit range of the second copy is 10272-10307.

| TS | 1st copy | | Bit range | 1024ths of a second |
|---------|----------|---------|-------------|---------------------|
| | minute# | second# | | |
| 1114.50 | 19 | 34 | 9984-10019 | 1141246 |
| 1122.50 | 19 | 42 | 12288-12323 | 1149438 |
| 1143.50 | 20 | 03 | 1056-1091 | 1170942 |
| 1146.50 | 20 | 06 | 1920-1955 | 1174014 |
| 1151.50 | 20 | 11 | 3360-3395 | 1179134 |
| 1156.50 | 20 | 16 | 4800-4835 | 1184254 |
| 1167.50 | 20 | 27 | 7968-8003 | 1195518 |
| 1171.50 | 20 | 31 | 9120-9155 | 1199614 |
| 1202.50 | 21 | 02 | 768-803 | 1231358 |
| 1212.50 | 21 | 12 | 3648-3683 | 1241598 |
| 1215.50 | 21 | 15 | 4512-4547 | 1244670 |
| 1222.50 | 21 | 22 | 6528-6563 | 1251838 |
| 1226.50 | 21 | 26 | 7680-7715 | 1255934 |
| 1231.50 | 21 | 31 | 9120-9155 | 1261054 |
| 1234.50 | 21 | 34 | 9984-10019 | 1264126 |
| 1240.50 | 21 | 40 | 11712-11747 | 1270270 |

These duplicates are due to identical sets of bit values for the two bit ranges in each row above.

None of the remaining five days has duplicate data lines. Day 2000-249 contains two places where frame times are out of order, but the other four days have only one. Below is a table that summarizes the time backups of all six days. For the incidence, the error seconds are in the middle of minute blocks for Days 2000-248 and 2000-292, at the beginning for 2000-249, and at the end for the remaining days. For the second incidence, they are in the middle for Day 2000-248 and middle/end for Day 2000-249. The remaining days have no second incidence.

| Day | 2000-248 | 2000-249 | 2000-251 | 2000-265 | 2000-292 | 2000-293 |
|--|----------|------------|----------|----------|----------|----------|
| Frame time out of order #1: pre-crossing | | | | | | |
| minute | 154 | 143 | 248 | 277 | 259 | 248 |
| second | 32 | 02 | 55 | 57 | 24 | 58 |
| start of bit range | 9408 | 768 | 16032 | 16608 | 7104 | 16896 |
| seconds/1024 | 9433514 | 8726954 | 15232434 | 17016098 | 15876514 | 15235490 |
| Frame time out of order #1: post-crossing | | | | | | |
| minute | 154 | 143 | 248 | 277 | 259 | 248 |
| second | 33 | 03 | 56 | 58 | 25 | 59 |
| start of bit range | 9696 | 1056 | 16320 | 16896 | 7392 | 17184 |
| seconds/1024 | 9433100 | 8726632 | 15232354 | 17015850 | 15876200 | 15235360 |
| position of error second (beginning, middle, or end of minute block) | | | | | | |
| | middle | beginning | end | end | middle | end |
| Frame time out of order #2 (where applicable): pre-crossing | | | | | | |
| minute | 261 | 249 | | | | |
| second | 28 | 41 | | | | |
| start of bit range | 8256 | 12000 | | | | |
| seconds/1024 | 16003508 | 15279540 | | | | |
| Frame time out of order #2 (where applicable): post-crossing | | | | | | |
| minute | 261 | 249 | | | | |
| second | 29 | 42 | | | | |
| start of bit range | 8544 | 12288 | | | | |
| seconds/1024 | 16003092 | 15279220 | | | | |
| position of error second (beginning, middle, or end of minute block) | | | | | | |
| | middle | middle/end | | | | |

APPENDIX G. DMSP ORBITAL ELEMENT VALIDATION

[This appendix was written by M. Kendra, of Radex, Inc.]

Quality assessment of DMSP orbital elements, identification of error sources, and estimates of the magnitude of orbit propagation errors are described. This effort relied on the orbital elements, and the propagation of orbital motion using extrapolation (SGP4) or interpolation (LOKANGL) software for ephemeris construction. The absolute accuracy of the ephemerides could not be determined from these techniques, and thus the results and conclusions described herein refer only to the relative quality and accuracy of the elements and their propagation software.

Data Description

Orbital elements were obtained from USSPACECOM for DMSP satellites F10 through F14 for 1999. These were in standard mean Keplerian format, commonly referred to as two-line element or TLE. Time resolution was approximately 8 hours for all satellites, with some occasional gaps. A cursory evaluation indicated that these gaps were not significant, usually smaller than 24 hours. The worst case was for F14, which was populated in 1044 of the 1095 available (8 hour) time slots.

Orbital elements for DMSP F15 were obtained for 2000, days 4–132. Days 4–61 were at 8 hour resolution, and the remainder at one day resolution.

Data Quality of the Orbital Elements

All data were checked to ensure the elements were monotonic in time and that the correct satellite identification number appeared on each line. An initial continuity and quality assessment was then made by examining time series plots of each of the Keplerian parameters. In general, these plots indicated that the parameter was continuous and piecewise smooth. There were several cases when one or more parameter exhibited an abrupt change. An example of one such change is given in Figure 1, where the mean anomaly and argument of perigee for F10 appear to be anomalous from 31 July through 2 August. Figure 2 shows a second example, where the orbital inclination for F15 appears to change in steps on 7 March and again on 17 April.

These anomalies were investigated with respect to ephemeris generation discrepancies as described in subsequent sections, and no clear correlation was found. They remain as error source candidates, however, because a definitive quality test could not be constructed for them.

Test Ephemeris Generation

Test ephemerides were generated using the SGP4 orbit propagator and the LOKANGL orbit propagator in interpolation mode. Two approaches were taken for the incremental time steps

used over the study period. In the first approach, a fixed time step of one hour was used. This allowed generation of ephemerides from all TLEs, or from subsets of TLEs over a study interval, and comparison the results. In the second approach, the time interval between adjacent TLEs, Δt , was used to generate pairs of test ephemerides. The first state vector of each pair was computed using the current TLE with a propagation time step of zero. The second state vector of the pair was computed using the previous TLE with a propagation time step of Δt , the time between the element set pair. This allowed comparison of the propagated and non-propagated state vector products.

In generating these test ephemerides, there was some concern that the single precision computations used by SGP4 might introduce some round off error which would bias the results. Results from a double precision version of SGP4 are compared to single precision results in Figure 3. Differences were generally within 50 meters, with a small negative bias. Although this is a relatively small and unimportant error source, prudence was exercised by using double precision ephemerides for all test cases. LOKANGL was already a double precision program.

Data Quality of the Test Ephemeris

Position differences were expressed as either the total position error or as its component in the direction of the spacecraft velocity vector, the in-track error (ITE). An example of the in-track error computed by SGP4 using time steps of the TLEs is shown for F15 in Figure 4. The error is generally within 0.5 km through 1 March, after which it becomes as large as 2 km. This abrupt change may be attributed the TLE interval changing from 8 hours to 24 hours, as described earlier. The long term trends, from a few days to several weeks, are real. When the TLE drag term ($\dot{n}/2$) is compared to computed values from the TLEs ($\Delta n/\Delta t$), as shown in Figure 4, there appear to be some important, systematic differences. These differences are compared to in-track error in Figure 5, and show a high correlation. Thus differences between the predicted drag ($\dot{n}/2$ or B^*) and the actual drag ($\Delta n/\Delta t$) are an important source of orbit propagation error for SGP4.

The effectiveness of LOKANGL of determining actual drag by interpolating over element set pairs was evaluated. A time step of one hour was used. The prediction error in processing every second, third, and tenth TLE with respect to the full TLE set was examined. The one hour time step ensures a consistent treatment for all comparisons regardless of the TLE set decimation. Results using every second TLE for F10 (satellite #18123) are shown in Figure 6. For this one month period the mean error and standard deviation of the error are each 101 m, although there are more than 20 periods when the error exceeds 200 m. This figure summarizes how the LOKANGL orbit interpolation errors grow as we increase the TLE time spacing from 8 to 16 hours.

A similar study for DMSP F15 over a three month period is presented in Figure 7. The mean error and standard deviation of the error are about 75 m, with 16 periods where the error exceeds 200 m. It is interesting to note that the errors are significantly smaller compared to the previous case.

A summary of errors for these and other TLE spacings is given in Table 1.

Conclusions

Error sources in DMSP satellite orbit propagation for 1999 and 2000 were examined. The TLEs appear to be of high quality, although several abrupt changes in the Keplerian components were noted. A comparison of single precision and double precision versions of SGP4 indicated that the double precision version should be used in order to minimize computational round-off.

It was found that differences between $\dot{n}/2$ values computed from mean motion and those provided in the TLEs were highly correlated with computed in-track error values, showing that the $\dot{n}/2$ and B^* drag terms are a large error source in orbit propagation.

The effectiveness of computing actual drag values using element set pairs was evaluated using the LOKANGL program. It was found that the relative orbit prediction error increased with the spacing between TLE pairs. Using this approach, it was found that the 1σ relative prediction errors are typically less than 200 m for TLEs with a spacing of 24 hours or less.

DMSP F10

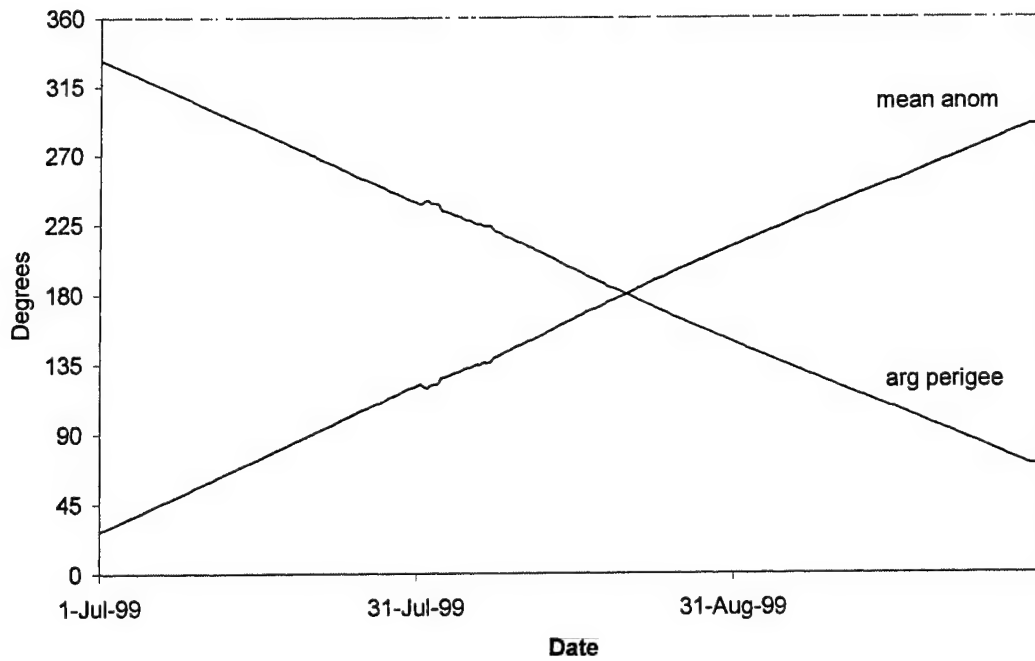


Figure 41. Original document Figure number 1.

DMSP F15

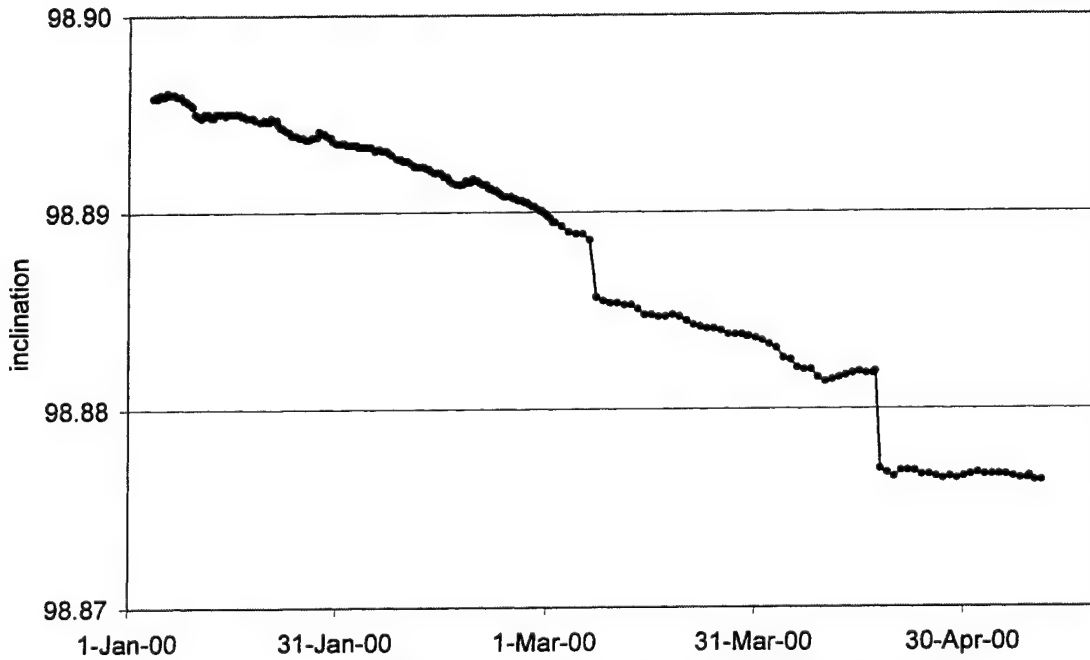


Figure 42. Original document Figure number 2.

ITE Single Versus Double Precision

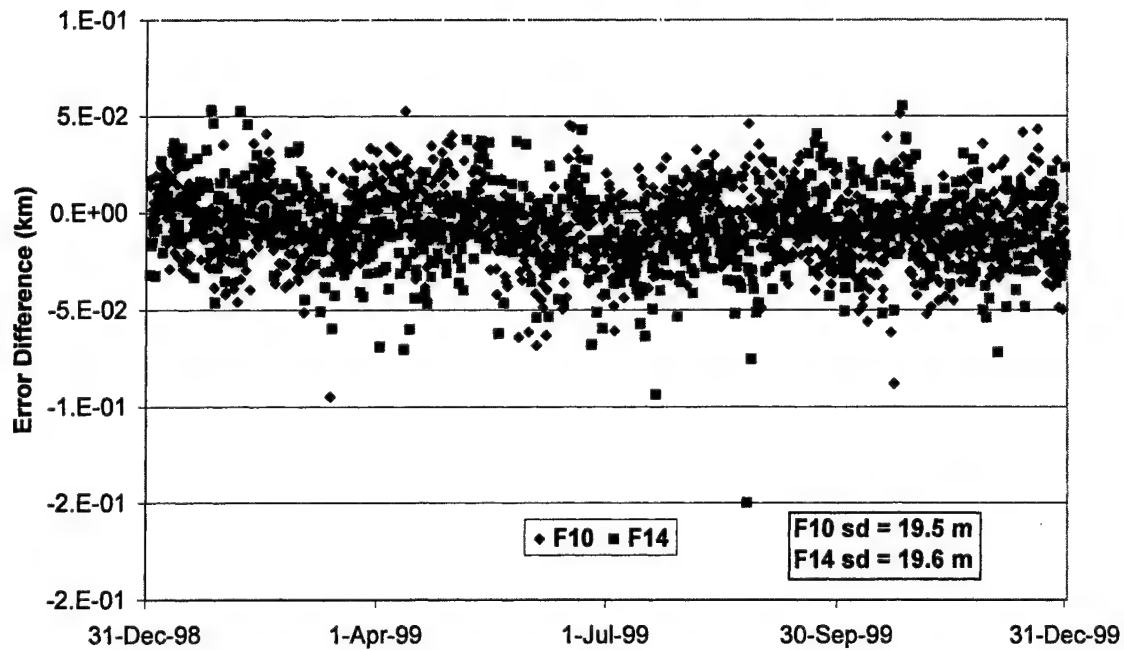


Figure 43. Original document Figure number 3.

DMSP F15

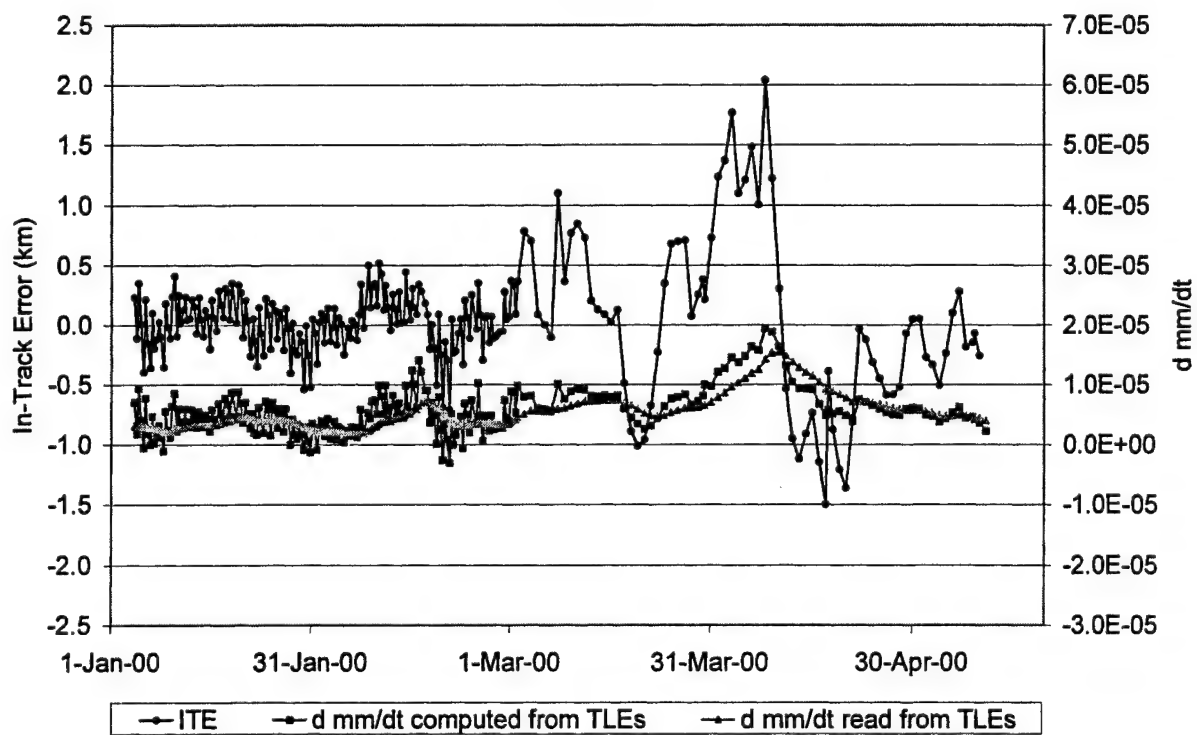


Figure 44. Original document Figure number 4.

DMSP F15

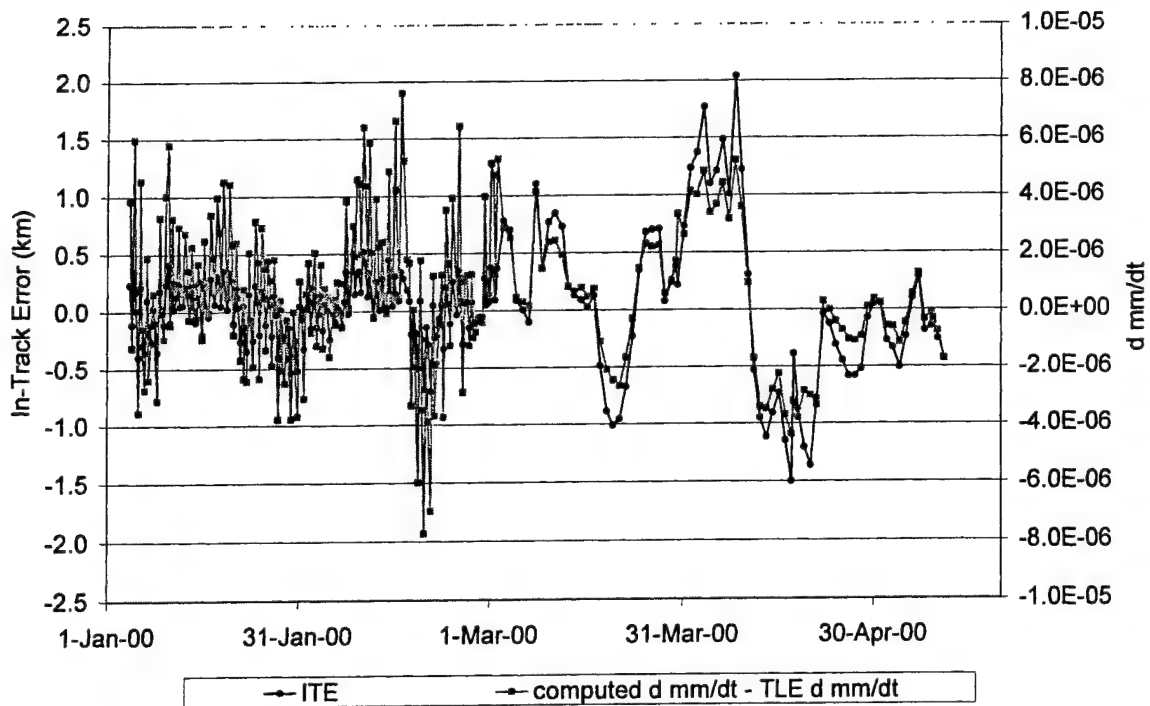


Figure 45. Original document Figure number 5.

18123 Orbit Prediction Error

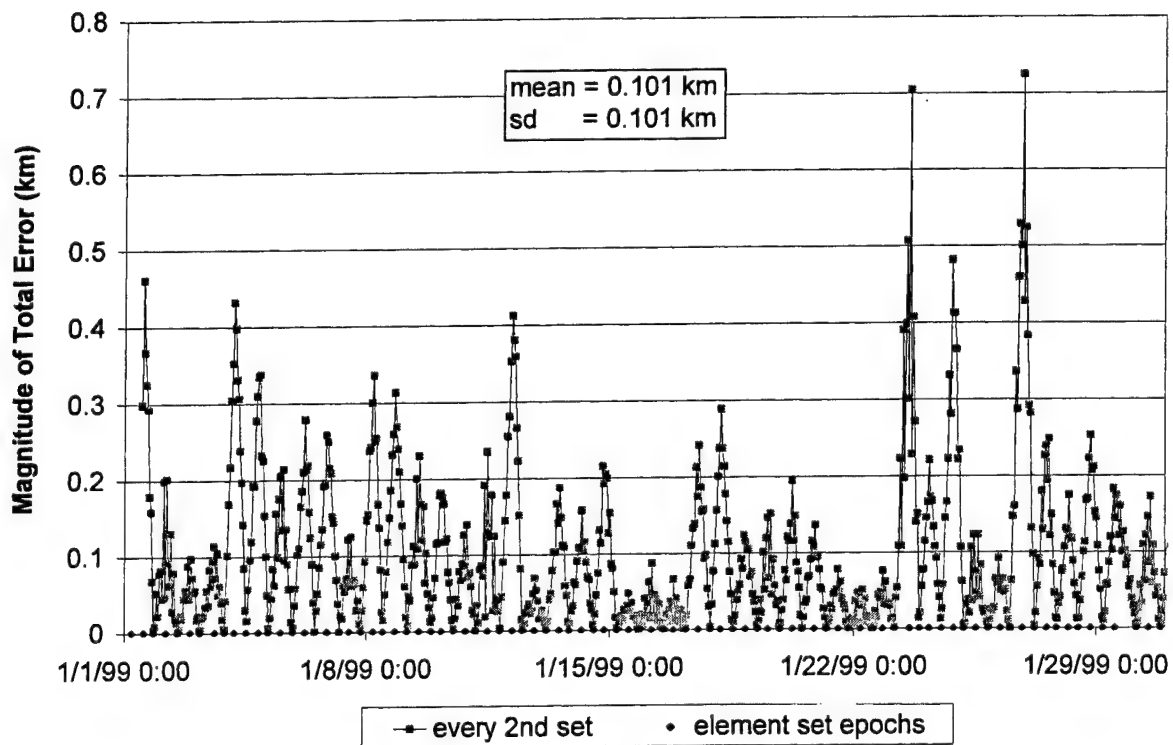


Figure 46. Original document Figure number 6.

DMSP F15 (sat 25991) Orbit Prediction Error

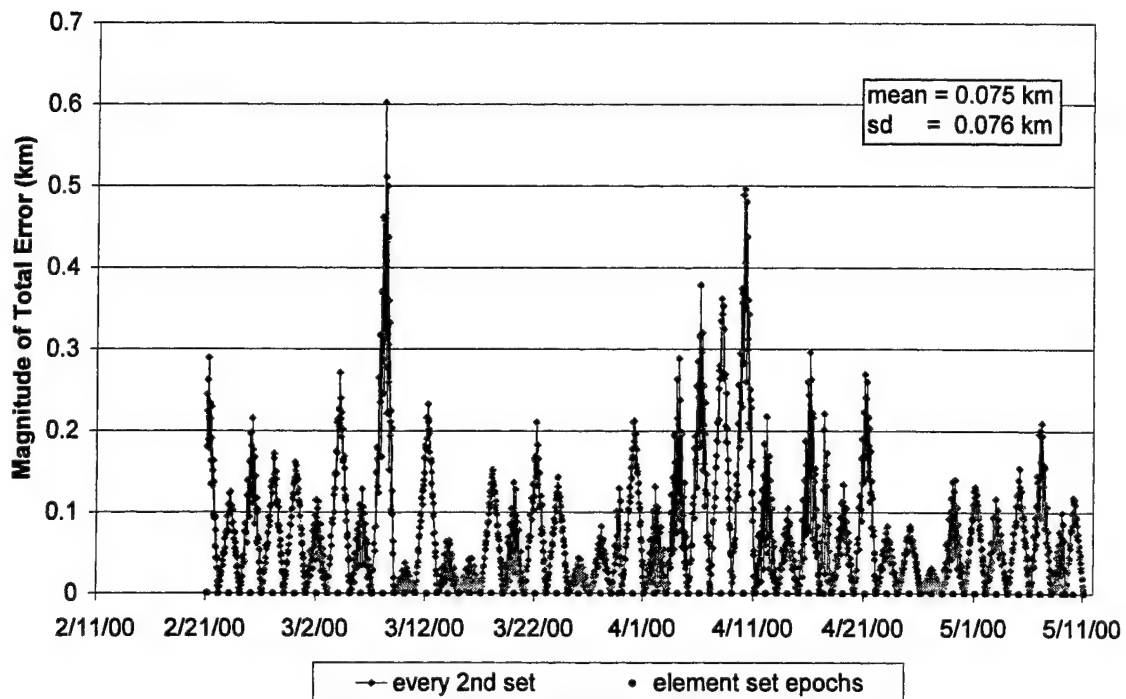


Figure 47. Original document Figure number 7.

| Original document Table number 1 | | | | | |
|----------------------------------|------------------------|-----------|-----------------|------------------|-----------------------|
| DMSP SAT | TIME SPAN | # OF TLEs | # STATE VECTORS | MEAN ERROR (m) | σ OF ERROR (m) |
| F10 | 1 Jan 99 31 Jan 99 | 91 | 721 | every 2nd: 101 | 101 |
| | | | | every 3rd: 167 | 129 |
| | | | | every 10th: 234 | 178 |
| F15 | 21 Feb 00 11 May 00 | 84 | 1933 | every 2nd: 75 | 76 |
| | | | | every 3rd: 161 | 151 |
| | | | | every 10th: 1058 | 959 |

APPENDIX H. ADDITIONAL BOOM STUDY PLOTS

This appendix contains GIF files that show various plots generated during this experiment. These plots illustrate parts of Sections 4.6 through 4.9 and are all introduced in Section 4.6.1. They are listed in the following order:

- Figure 48.** Baseline curve, Day 1999-357, 00:00-04:00 UT. Referred to in Sections 4.6.1, 4.6.2.1 and 4.8.2.1.
- Figure 49.** Continual twist, $(A,B,C) = (1,0,1)$, Day 1999-357, 00:00-04:00 UT. See Sections 4.6.1, 4.6.2.1, 4.6.2.2, and 4.7.2.
- Figure 50.** Continual twist, $(A,B,C) = (1,1,-1)$, Day 1999-357, 00:00-04:00 UT. See Sections 4.6.1, 4.6.2.2 and 4.7.2.
- Figure 51.** Thermal twist, maximum angle = 2.5 degrees, Day 1999-357, 00:00-04:00 UT. See Sections 4.6.1 and 4.6.2.1
- Figure 52.** Impulse twist, maximum angle = 1.5 degrees, Day 1999-357, 00:00-04:00 UT. See Sections 4.6.1 and 4.6.2.3.
- Figure 53.** Impulse twist, maximum angle = 2.5 degrees, Day 1999-357, 00:00-04:00 UT. See Sections 4.6.1, 4.6.2.1 and 4.6.2.3.
- Figure 54.** Combination of continual, thermal, and impulse twists, Day 1999-357, 00:00-04:00 UT. See Sections 4.6.1 and 4.6.2.1
- Figure 55.** Continual twist, $(A,B,C) = (1,1,1)$, Day 1999-357, 00:00-04:00 UT. See Sections 4.7.1 and 4.7.2.
- Figure 56.** Continual twist, $(A,B,C) = (1,0,0)$, Day 1999-357, 00:00-04:00 UT. See Sections 4.7.1 and 4.7.2.
- Figure 57.** Continual twist, $(A,B,C) = (0,1,0)$, Day 1999-357, 00:00-04:00 UT. See Sections 4.7.1 and 4.7.2.
- Figure 58.** Continual twist, $(A,B,C) = (0,0,1)$, Day 1999-357, 00:00-04:00 UT. See Sections 4.7.1 and 4.7.2.
- Figure 59.** Baseline curve, field versus time, all 24 hours of Day 2000-050. See Section 4.9.2.1.
- Figure 60.** Thermal twist, field versus time, all 24 hours of Day 2000-050. See Section 4.9.2.1.
- Figure 61.** Impulse twist, field versus time, all 24 hours of Day 2000-050. See Section 4.9.2.1
- Figure 62.** Baseline curve, FT of field vs. time, X-axis, all 24 hours of Day 2000-050, with only field values between -10000 and 10000. See Section 4.9.2.5
- Figure 63.** Thermal twist, FT of field vs. time, X-axis, all 24 hours of Day 2000-050, with only field values between -10000 and 10000. See Section 4.9.2.5.

DMSP F15 SSM Data from Julian Day 357
Baseline APSM

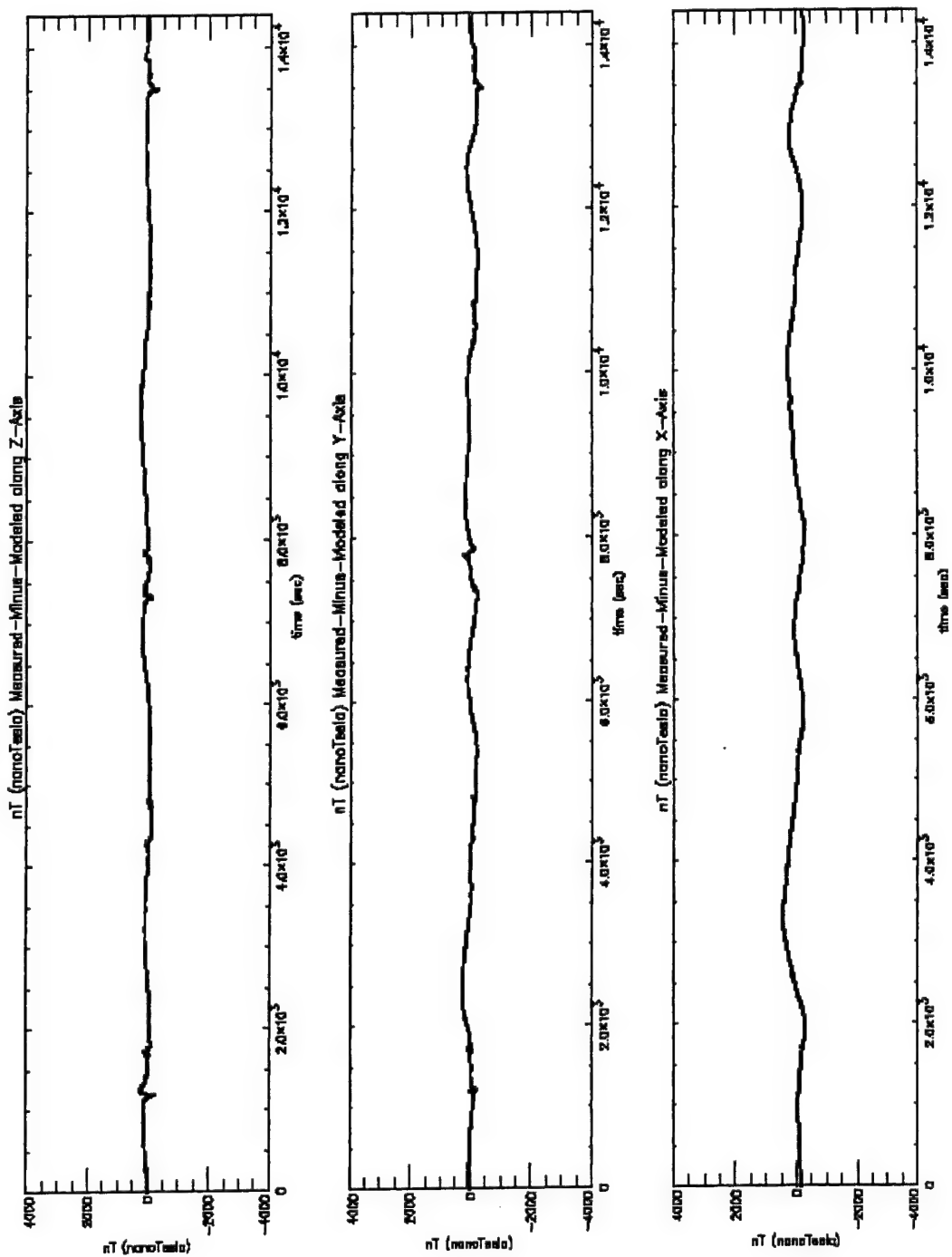


Figure 48.

Baseline curve, Day 1999-357, 00:00-04:00 UT. Referred to in Sections 4.6.1, 4.6.2.1 and 4.8.2.1.

DMSP F15 SSM Data from Julian Day 357
 Oscillation Only, $A = C = 1$ deg, $B = 0$ deg

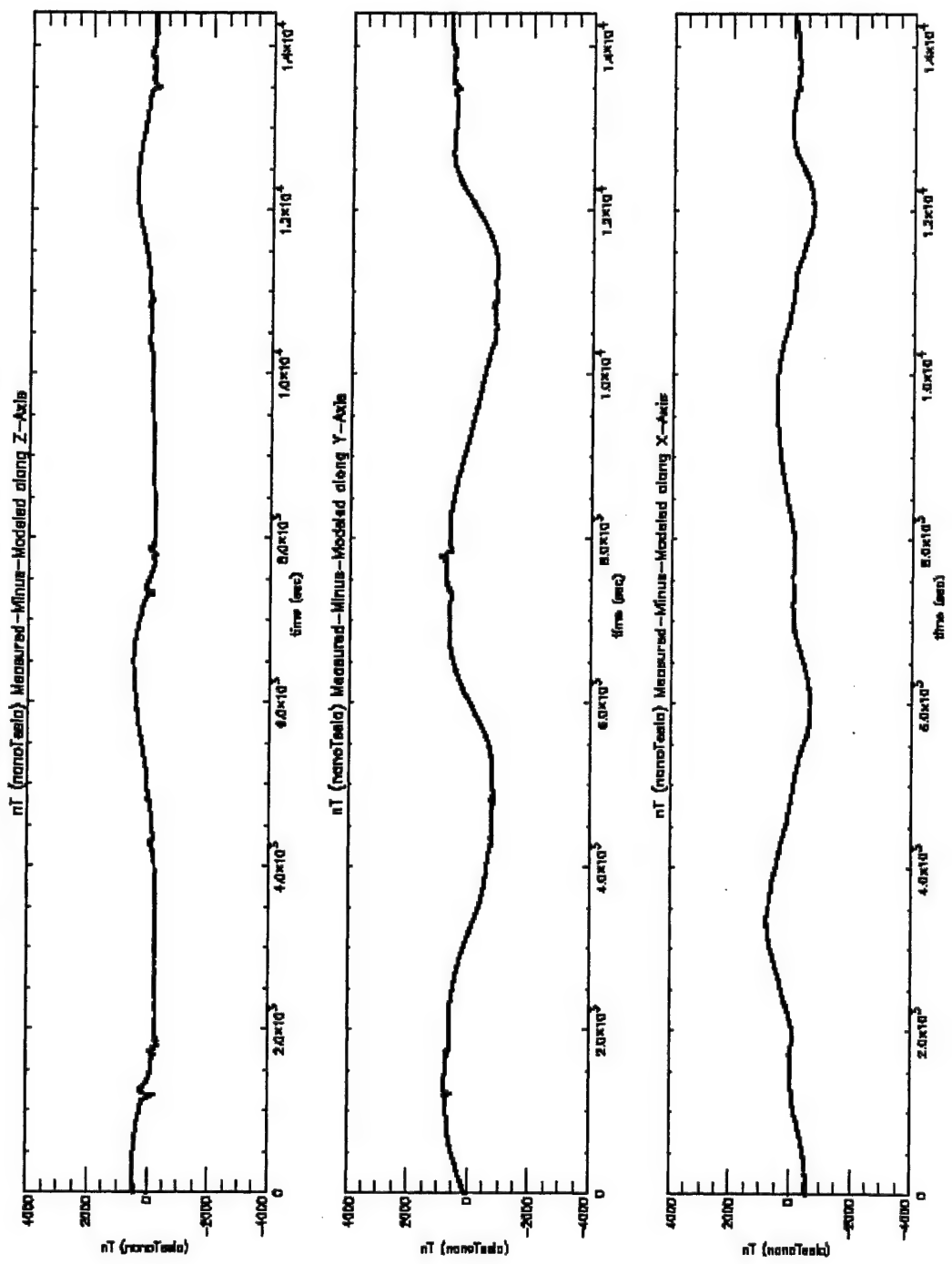


Figure 49. Continual twist, $(A,B,C) = (1,0,1)$ Day 1999-357, 00:00-04:00 UT.
 See Sections 4.6.1, 4.6.2.1, 4.6.2.2, and 4.7.2.

DMSP F15 SSM Data from Julian Day 357
Oscillation Only, $A = B = 1$ deg, $C = -1$ deg

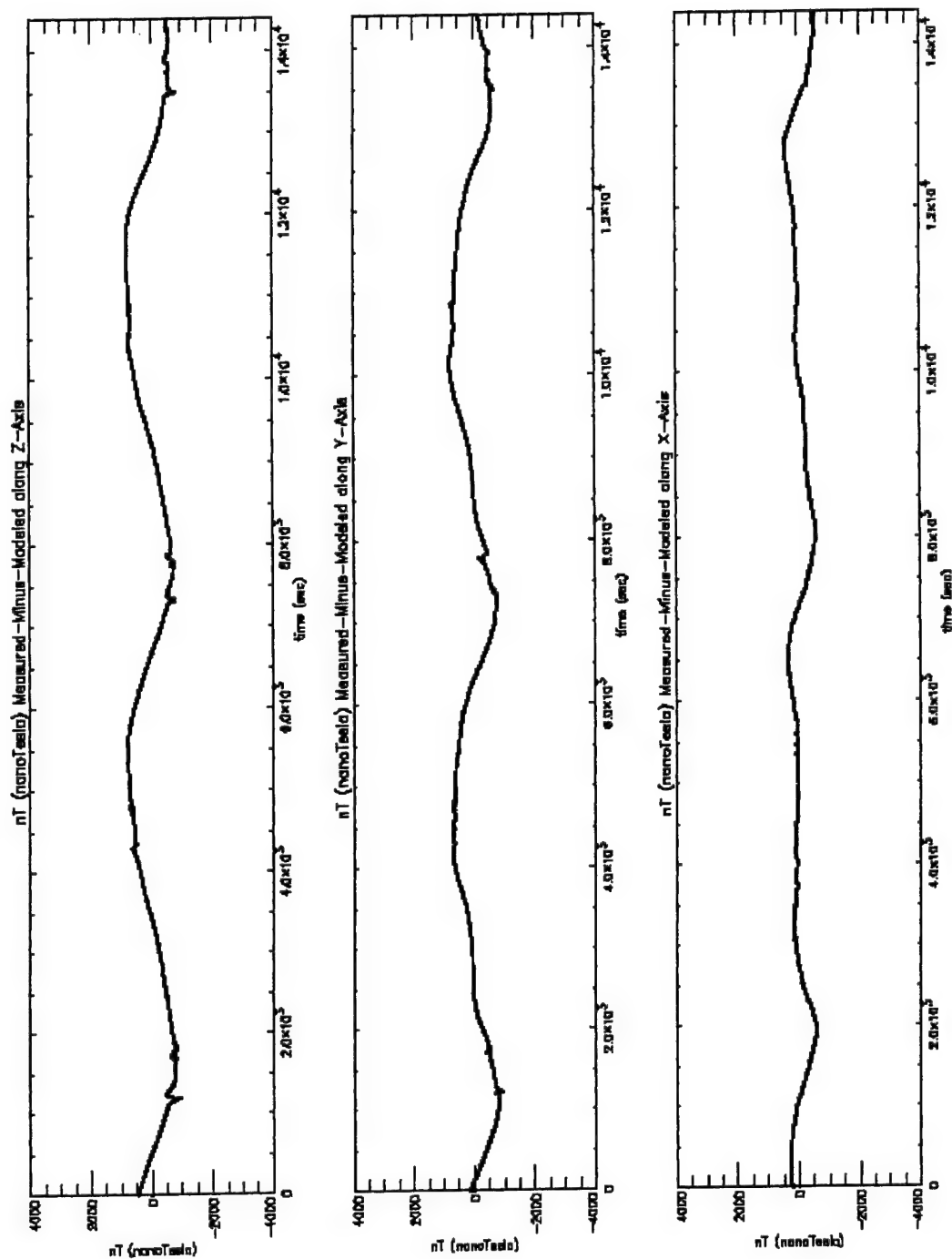


Figure 50. Continual twist, $(A,B,C) = (1,1,-1)$, Day 1999-357, 00:00-04:00 UT.
See Sections 4.6.1, 4.6.2.2 and 4.7.2.

DMSP F15 SSM Data from Julian Day 357
Thermal Only

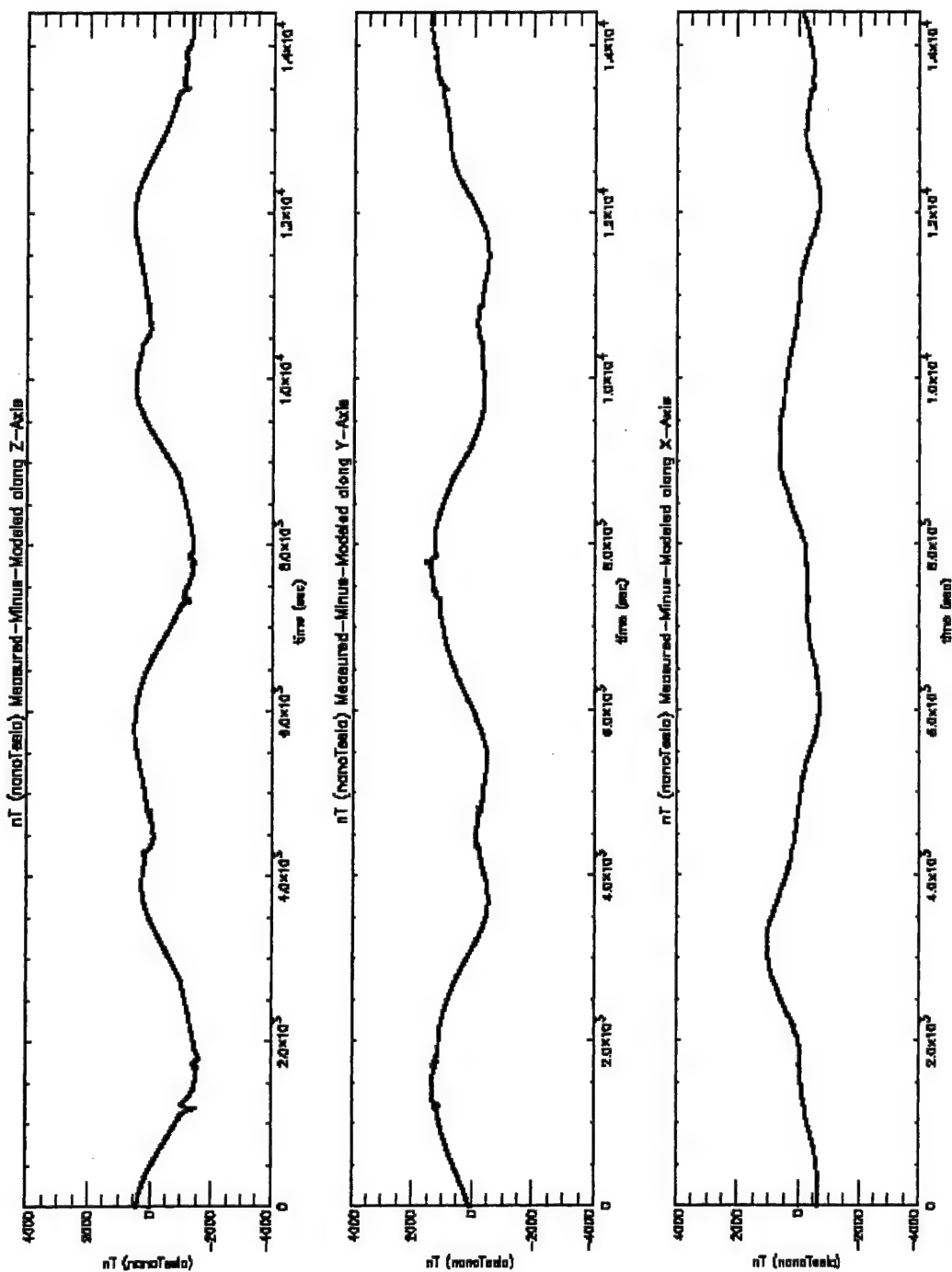


Figure 51.

Thermal twist, maximum angle = 2.5 degrees, Day 1999-357, 00:00-04:00 UT.
See Sections 4.6.1 and 4.6.2.1.

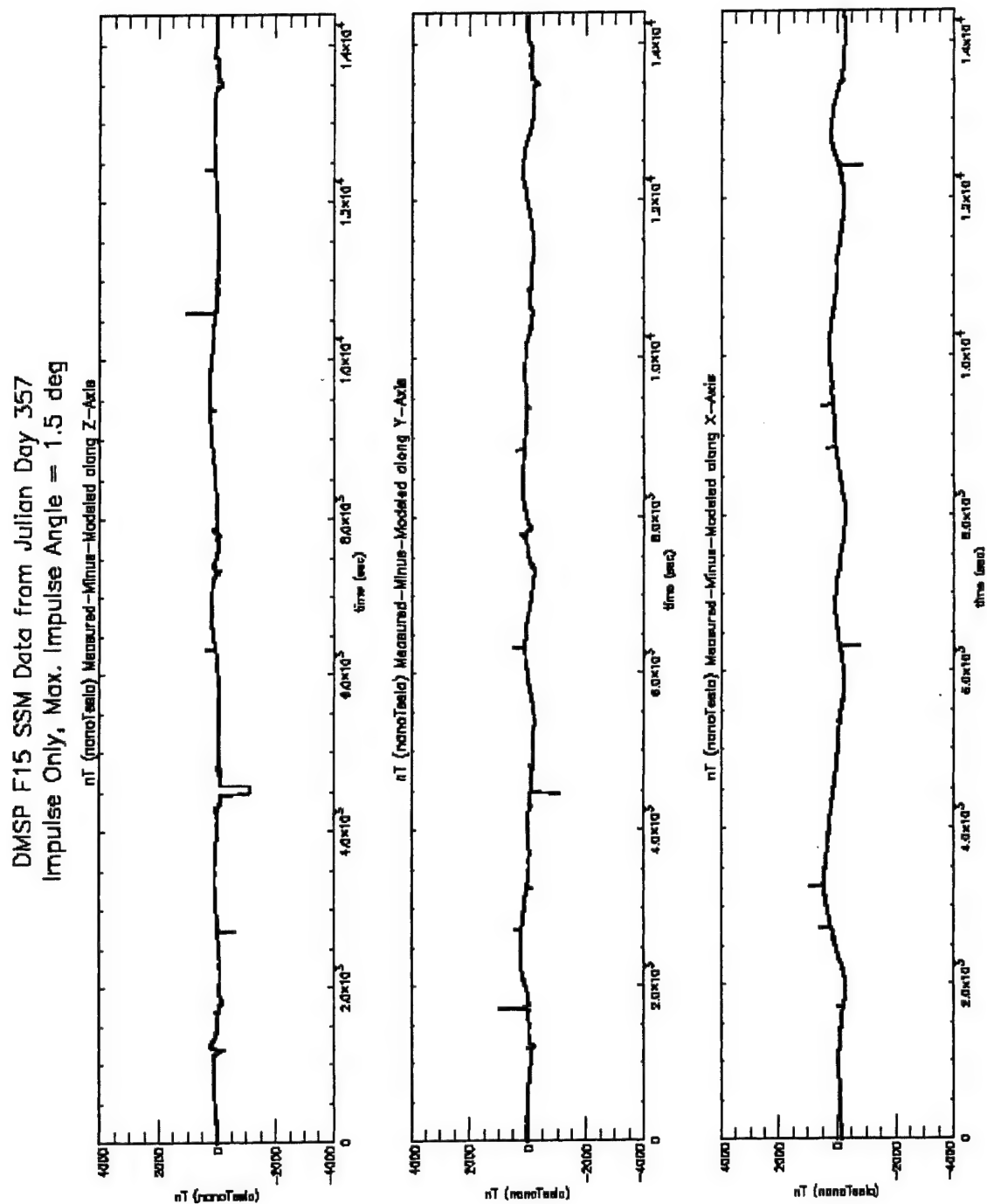


Figure 52. Impulse twist, maximum angle = 1.5 degrees, Day 1999-357, 00:00-04:00 UT.
See Sections 4.6.1 and 4.6.2.3.

DMSP F15 SSM Data from Julian Day 357
Impulse Only, Max. Impulse Angle = 2.5 deg

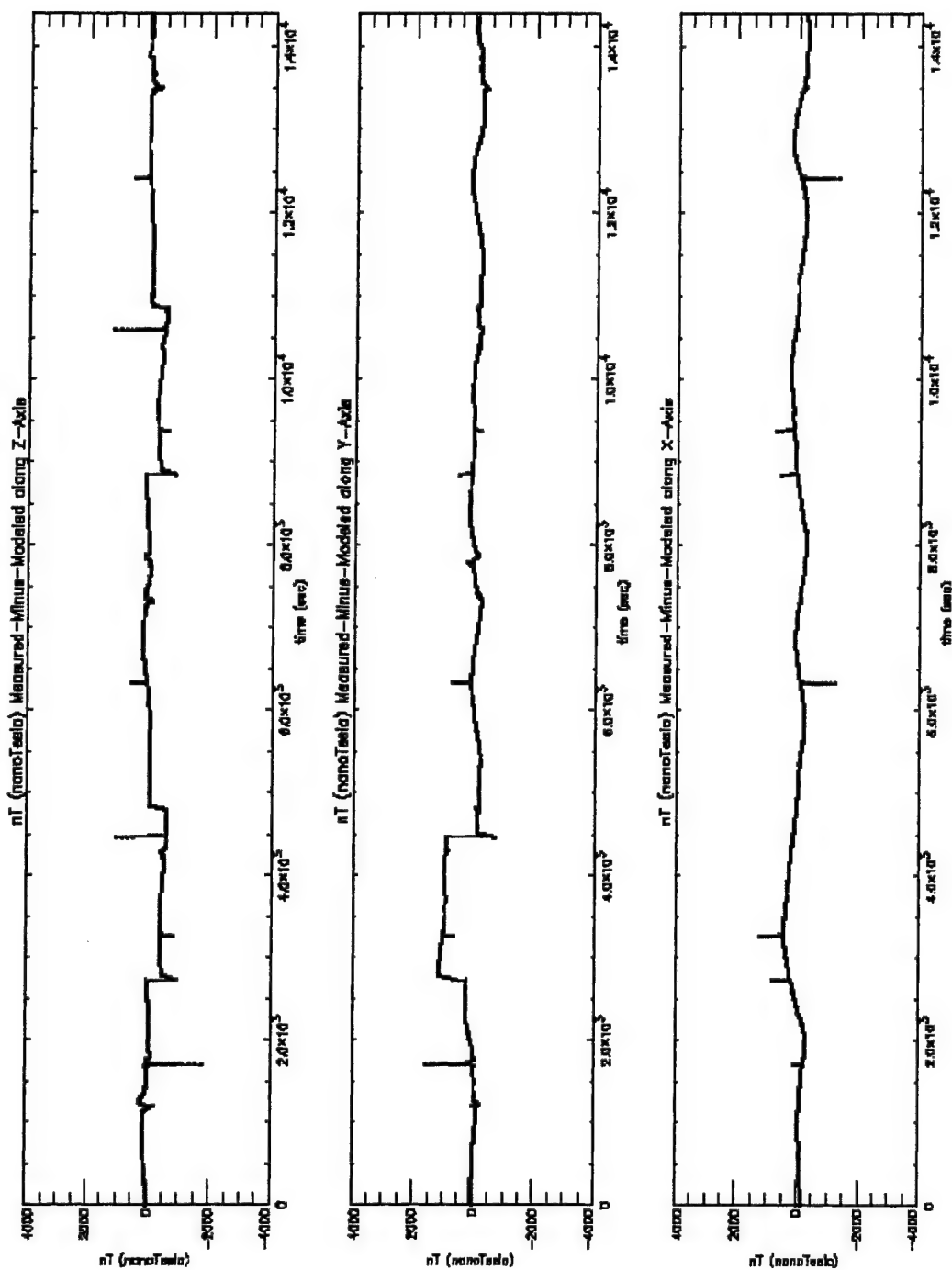


Figure 53. Impulse twist, maximum angle = 2.5 degrees, Day 1999-357, 00:00-04:00 UT.
See Sections 4.6.1, 4.6.2.1 and 4.6.2.3.

DMSP F15 SSM Data from Julian Day 357
Impulse, Thermal, and Oscillation

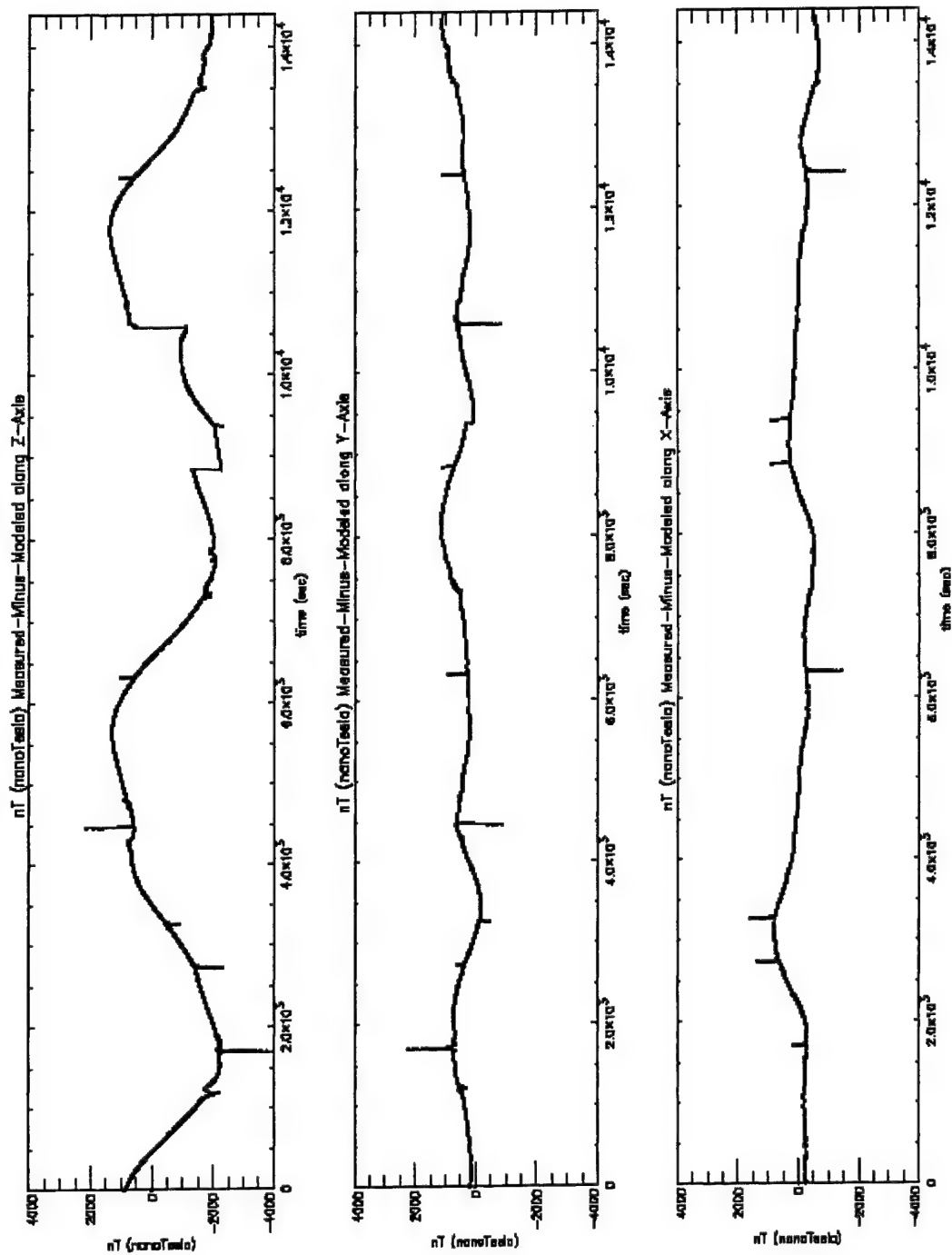


Figure 54. Combination of continual, thermal, and impulse twists, Day 1999-357, 00:00-04:00 UT.
See Sections 4.6.1 and 4.6.2.1.

DMSP F15 SSM Data from Julian Day 357
Oscillation Only, $A = B = C = 1$ deg

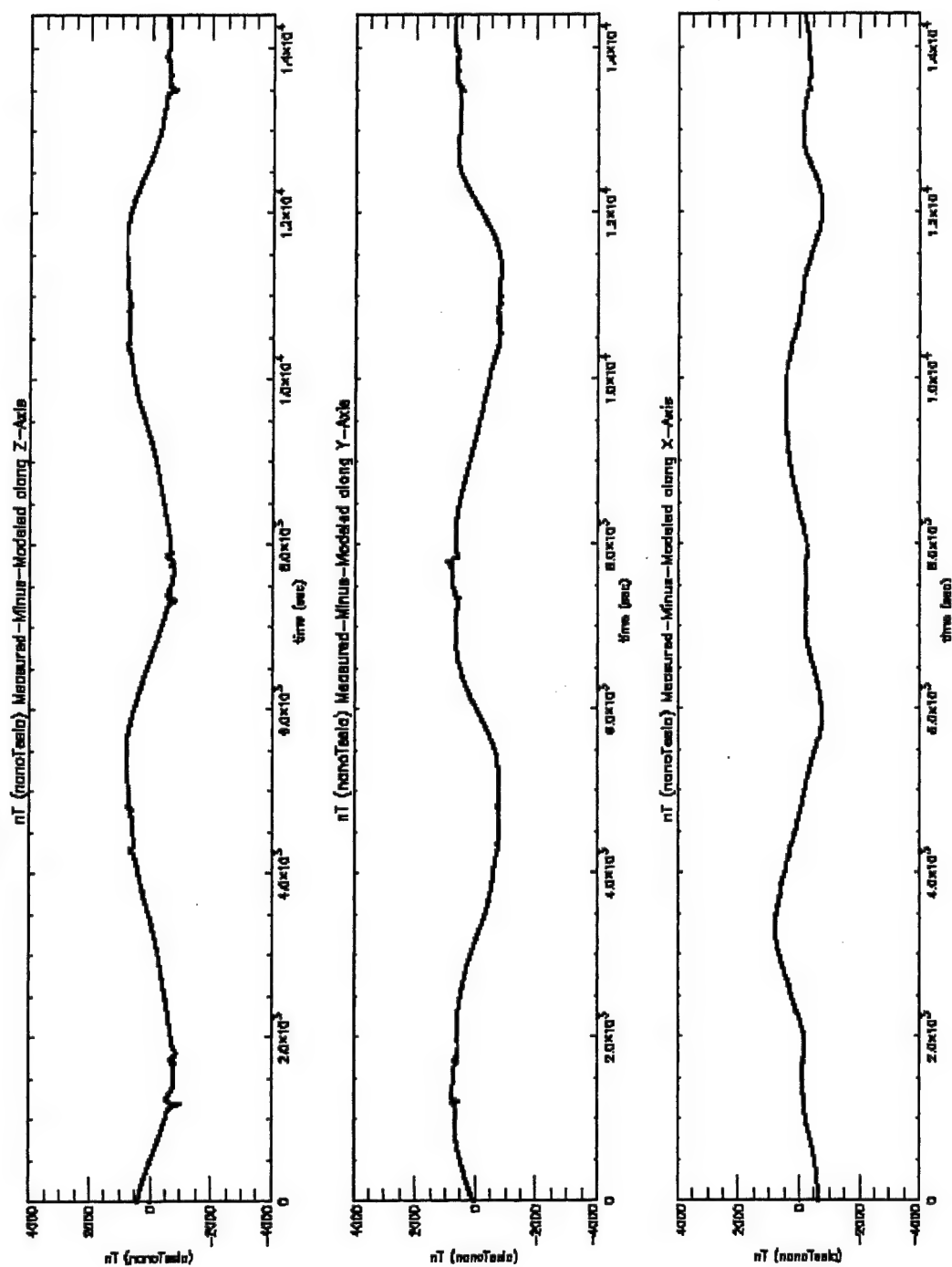


Figure 55.

Continual twist, $(A,B,C) = (1,1,1)$, Day 1999-357, 00:00-04:00 UT.
See Sections 4.7.1 and 4.7.2.

DMSP F15 SSM Data from Julian Day 357
Oscillation, $A = 1$ deg.

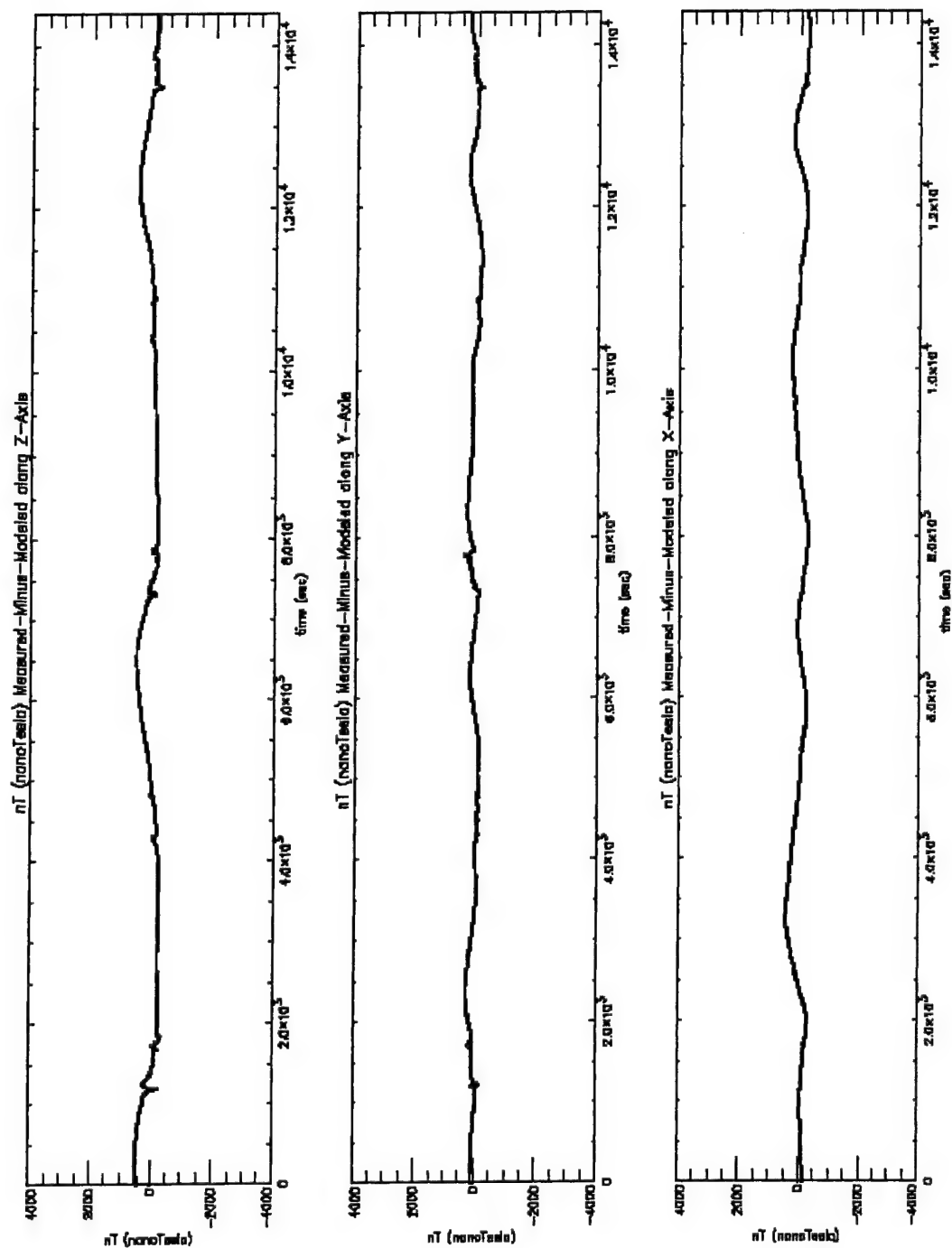


Figure 56.

Continual twist, (A,B,C) = (1,0,0), Day 1999-357, 00:00-04:00 UT.
See Sections 4.7.1 and 4.7.2.

DMSP F15 SSM Data from Julian Day 357
Oscillation, $B = 1$ deg.

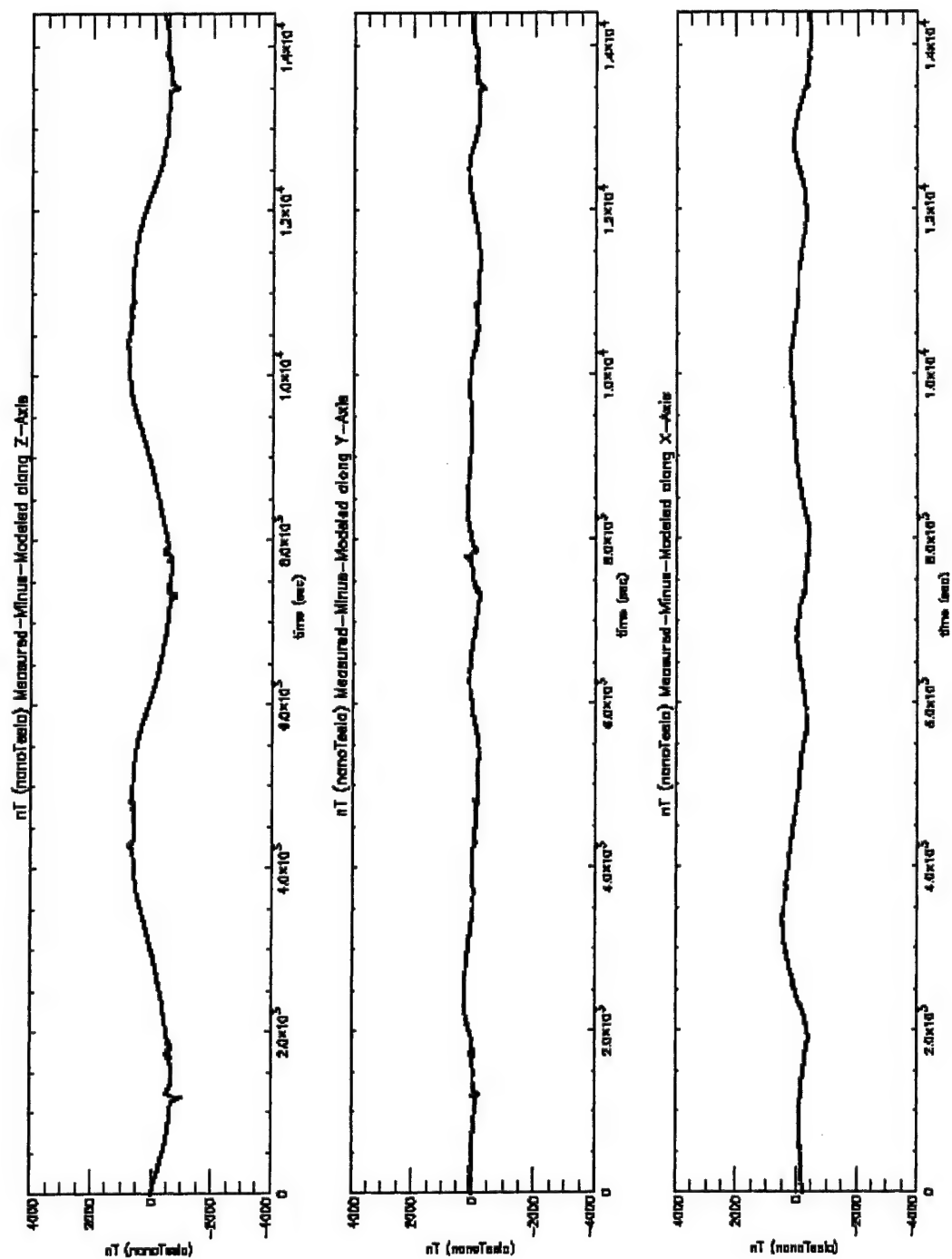


Figure 57.

Continual twist, $(A,B,C) = (0,1,0)$, Day 1999-357, 00:00-04:00 UT.
See Sections 4.7.1 and 4.7.2.

DMSP F15 SSM Data from Julian Day 357
Oscillation, $C = 1$ deg.

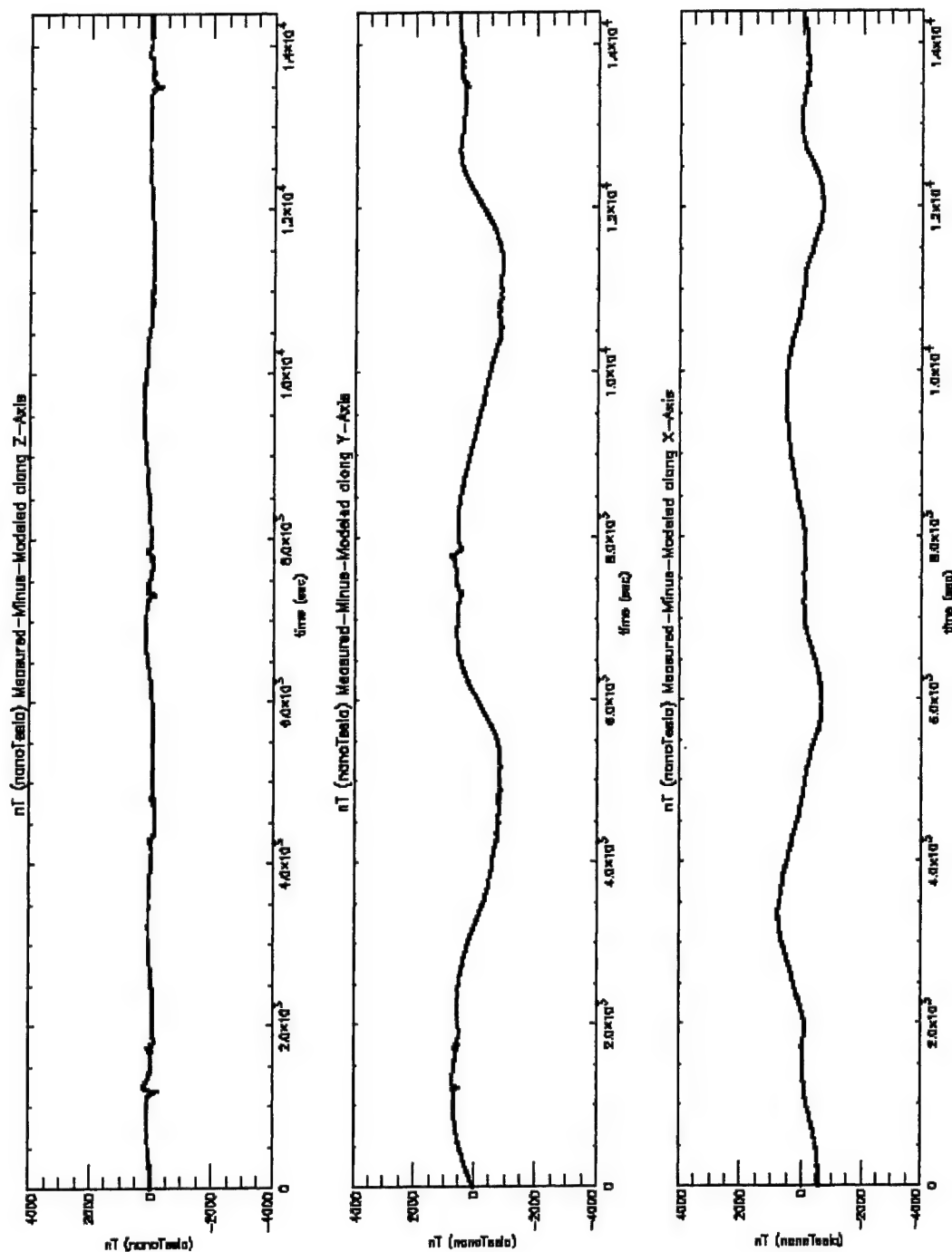


Figure 58.

Continual twist, $(A,B,C) = (0,0,1)$, Day 1999-357, 00:00-04:00 UT.
See Sections 4.7.1 and 4.7.2.

DMSP F15 SSM Data from Julian Day 050
Measured-Minus-Modeled Field versus Time

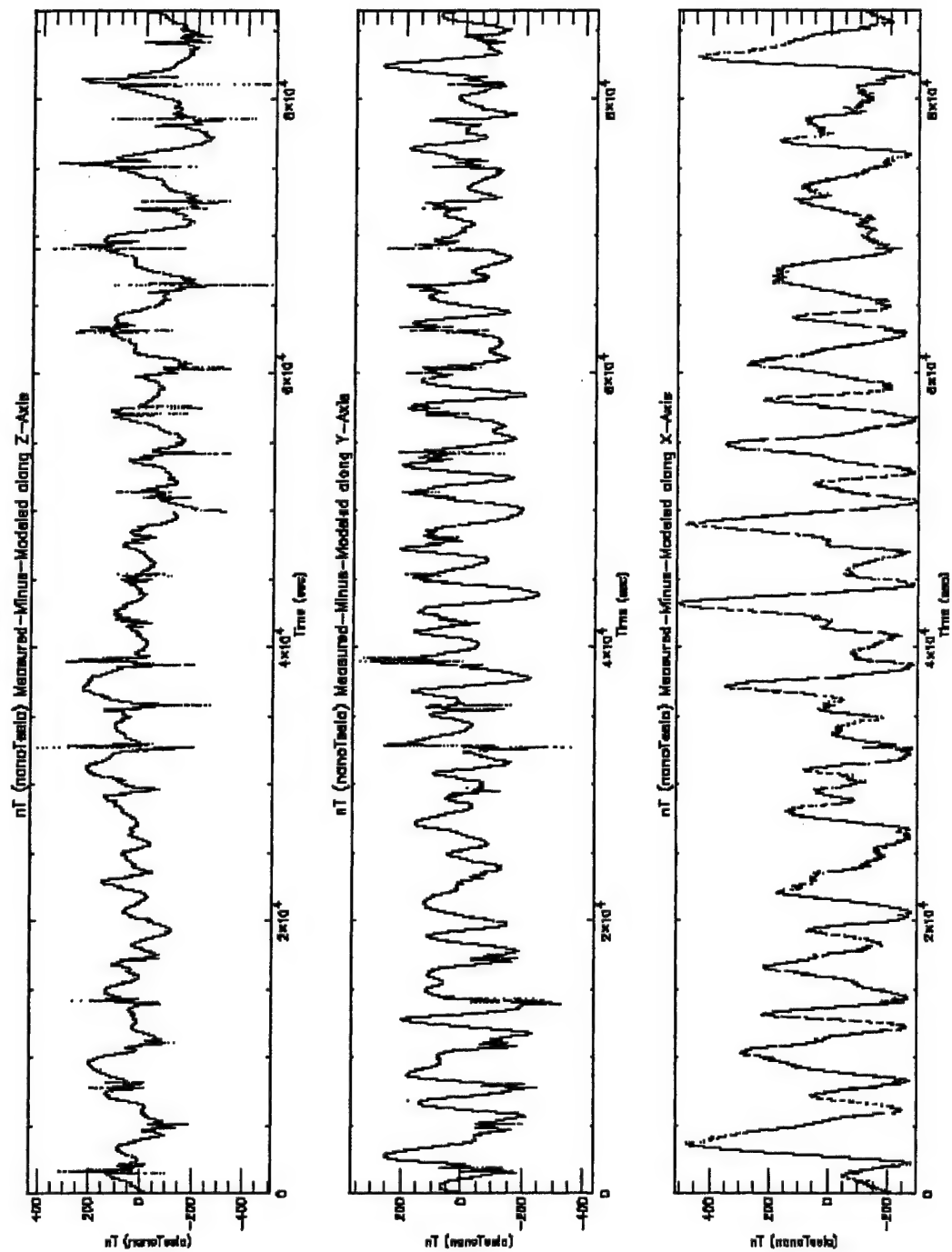


Figure 59.

Baseline curve, field versus time, all 24 hours of Day 2000-050. See Section 4.9.2.1.

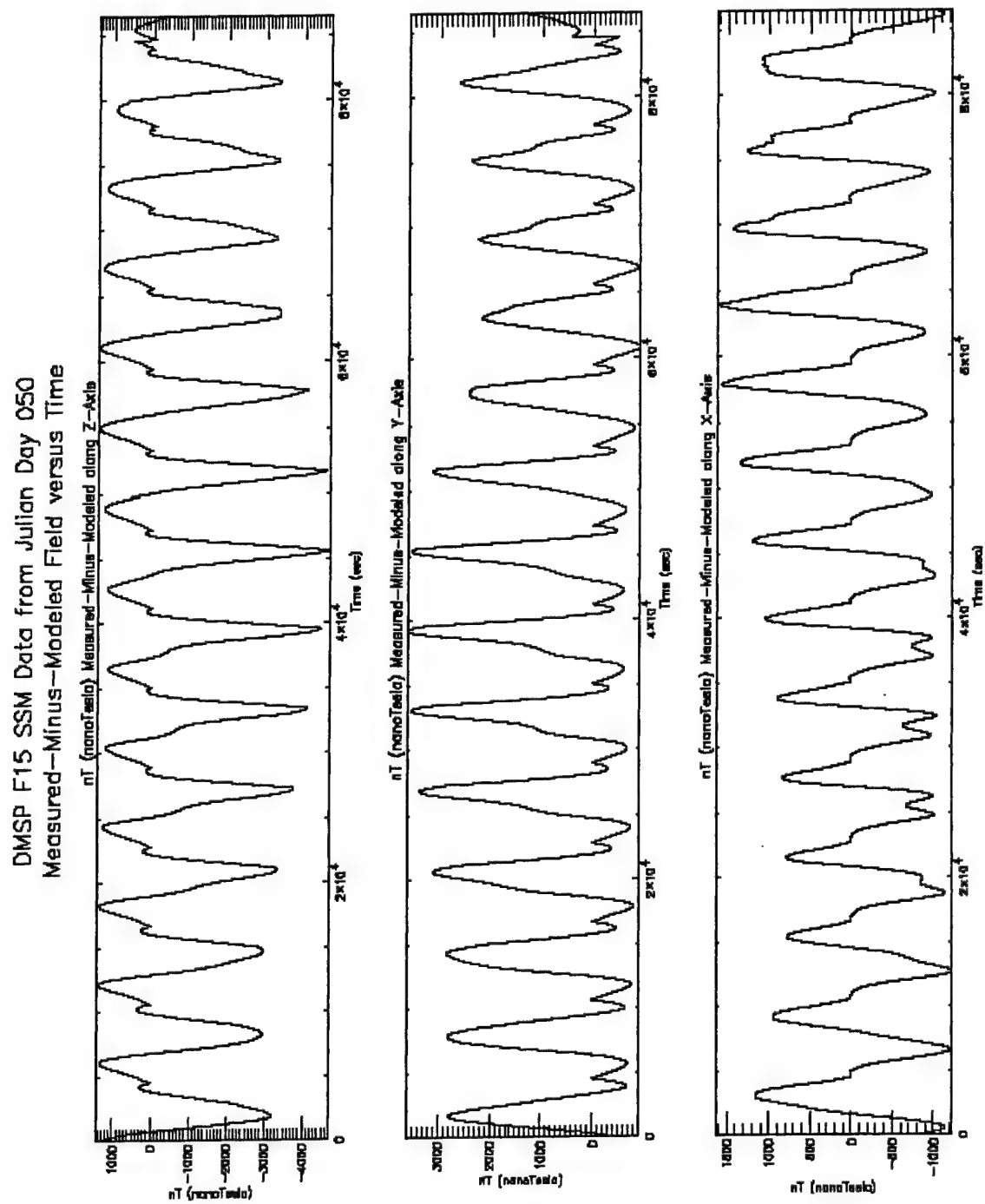


Figure 60.

Thermal twist, field versus time, all 24 hours of Day 2000-050. See Section 4.9.2.1.

DMSP F15 SSM Data from Julian Day 050
Measured-Minus-Modeled Field versus Time

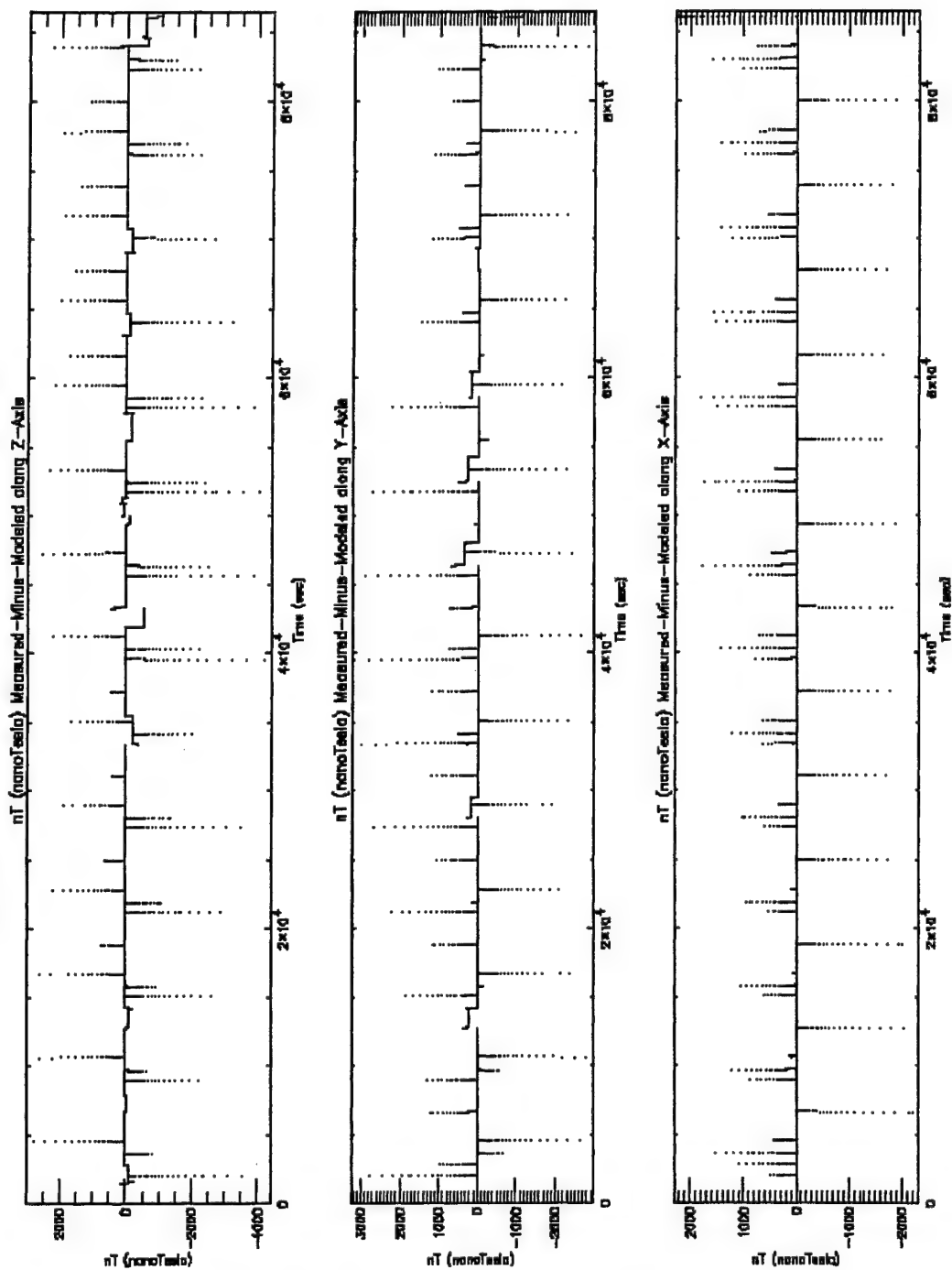


Figure 61.

Impulse twist, field versus time, all 24 hours of Day 2000-050. See Section 4.9.2.1.

DMSP (F15 - F14) SSM Data from Julian Day 050
 Measured-Minus-Modeled Field versus Time-Frequency Variable

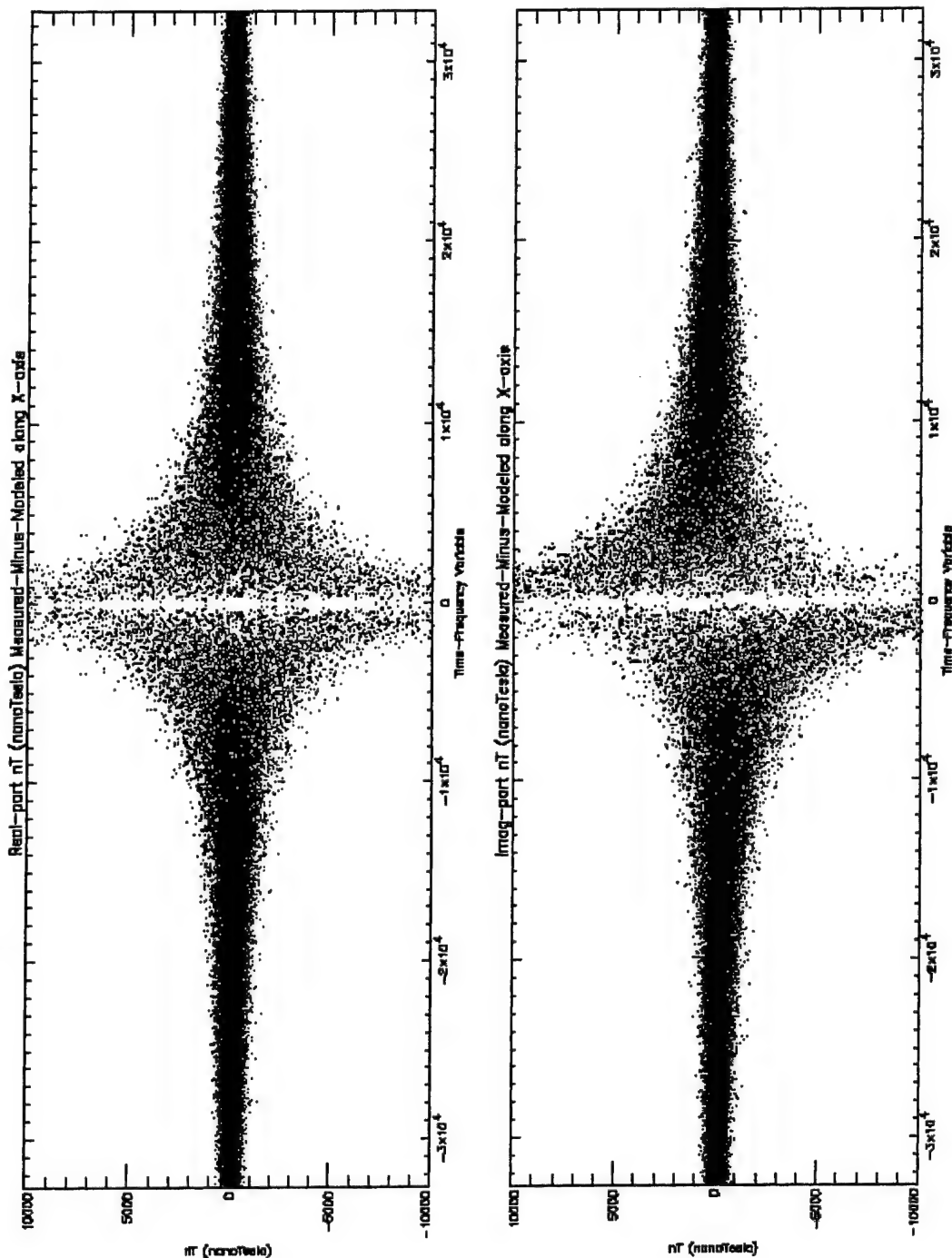


Figure 62.

Baseline curve, FT of field vs. time, X-axis, all 24 hours of Day 2000-050, with only field values between -10000 and 10000. See Section 4.9.2.5.

DMSP (F15 - F14) SSM Data from Julian Day 050
Measured-Minus-Modeled Field versus Time-Frequency Variable

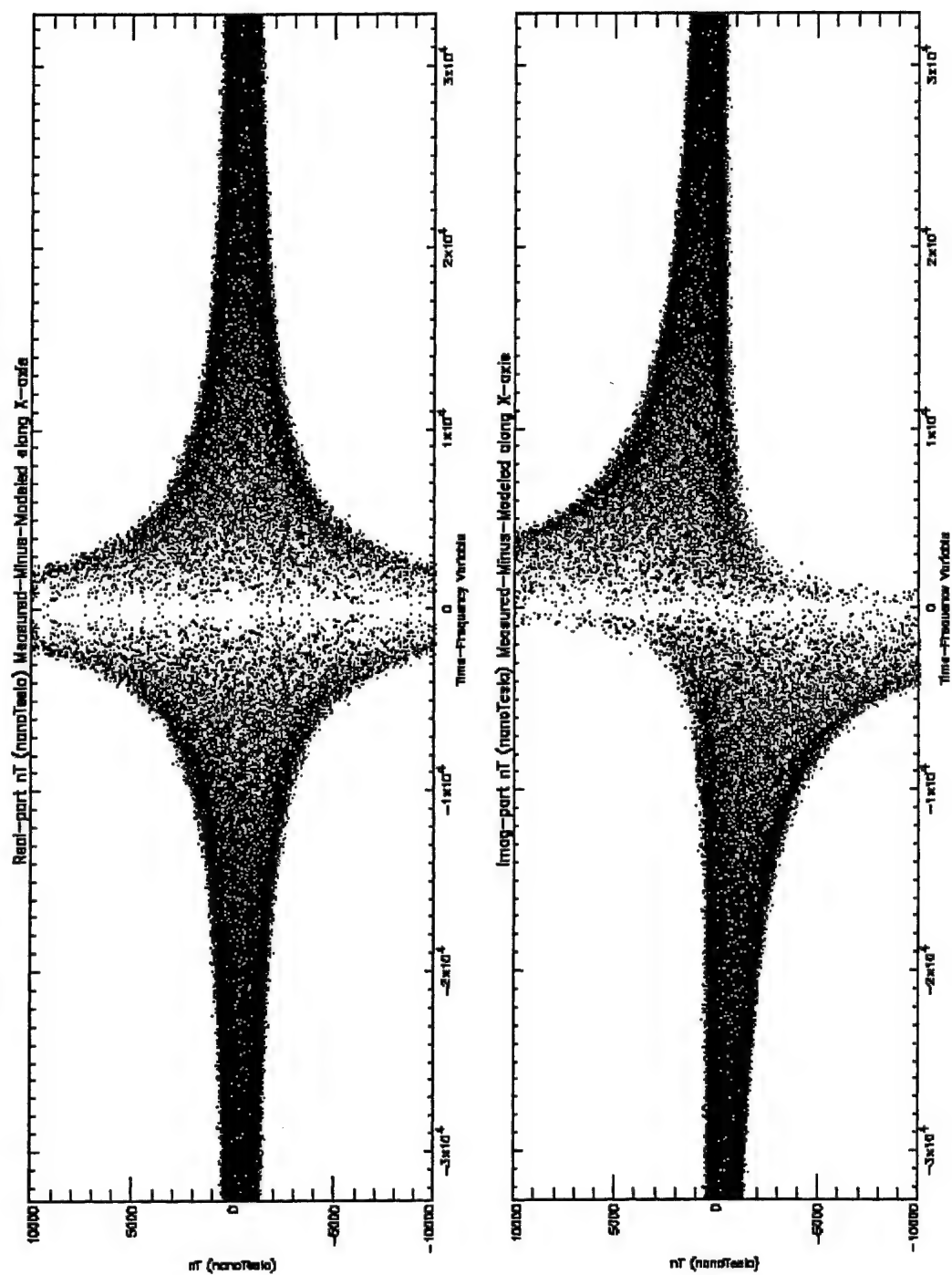


Figure 63. Thermal twist, FT of field vs. time, X-axis, all 24 hours of Day 2000-050, with only field values between -10000 and 10000. See Section 4.9.2.5.

APPENDIX I. GLOSSARY OR TERMINOLOGY

For reference, the terms and acronyms most frequently used in this paper are defined here.

| | |
|------------------------|--|
| AAVMMM | Average Absolute Value of the Measured-Minus-Modeled (MMM) magnetic field. This value is an index of the number and amplitudes of periodic functions in the MMM field. |
| active | Displaying many artifacts and jumps, as opposed to quiet. Active periods generally have a high Ap or Kp. |
| additive | Two boom twists that when added together, their joint effect on the resulting plot equals the sum of the individual effects. Here the sum is performed according to the rules of constructive and destructive interference of waves. |
| amplitude | The value of NanoTesla (nT) at the top or bottom of a curve or a piece of the curve. The amplitude is the maximum vertical distance, in nT, of the curve from the horizontal line of zero nT. |
| APHB | Old name for Program APSM. |
| APSM | The current FORTRAN program that converts raw magnetometer data into MFR files. Two introductory programs, SFC1 and SFC2, must be run before APSM to convert BC data files to APSM input files. |
| artifact | A disturbance in the baseline curve created by man or his works. |
| ascending node | A northbound crossing of the equator by the satellite. |
| auroral region | An interval of latitudes where auroras often occur. This interval usually lies in high latitudes in both hemispheres. |
| average absolute value | The average field strength in NanoTesla, independent of sign (plus or minus), over a set of field strengths in a given direction (X, Y, or Z). |
| B | $B = [B_x \ B_y \ B_z]$, a magnetic field vector. |

| | |
|--------------------------|---|
| baseline curve | A curve that plots the measured-minus-modeled field without induced errors. The vector of data plotted in this curve is referred to within this report as "W." W can be assumed to measure the field difference "boom minus non-boom," since the "boom" quantity is the actual measurement recorded by F15 and the "non-boom" field is our best estimate of what the model would compute. |
| best fit | The most error reduction attainable by setting one or more parameters to the correct values. |
| boom | 5m rod that protrudes from the satellite body. The F15 sensor is placed at the end of this rod. |
| Boston-College file | A raw data file of the format produced by software provided by Boston College. |
| bowstring | A long straight line running across a plot of field versus latitude, or across a similar-looking plot. |
| Bx | The X (down) component of a magnetic field vector. |
| By | The Y (direction of motion) component of a magnetic field vector. |
| Bz | The Z (orbit normal) component of a magnetic field vector. |
| calibration | A correction of the difference between the spacecraft axes and the magnetometer axes. |
| calibration accuracy | Consistency of the minimization of the difference between measured and modeled. |
| calibration drift | Change in optimal calibration as a function of time due to change in the factors being corrected by the calibration, again as a function of time. drift. |
| calibration error | The difference between measured and modeled excluding activity and artifacts. |
| calibration independence | The quality of not changing when the calibration matrices ORTHO and OFFSET are varied. For example, the boom-effect simulations of Sections 4.6, 4.7, and 4.8 are calibration-independent, but the boom-effect decomposition of Section 4.9 is not. |

| | |
|------------------------------|--|
| calibration matrix | A constant three-dimensional rotation or offset matrix used for calibration. For more information, see "calibration" above. |
| change of shading | Sudden change of grayness or color on a field-versus-altitude plot. |
| coefficient | A component of the solution vector of a least-squares equation. This coefficient is the value of a twist angle in degrees. Also, any solution constant, or any constant that multiplies a variable or another value. |
| complex number | A number with a real part and an imaginary part. See "real" and "imaginary." |
| component | One of N values of a vector or matrix. Also, one of three twist types (continual, thermal, or impulse) possibly present in a given curve. |
| continual oscillation | Effective rotation of the magnetometer around up to three axes, by an amount that remains constant over the course of a satellite orbit, due to a motion of the boom relative to the satellite. |
| cross-talk | Contribution of one dimension (e.g. X) of the magnetic field to what is hoped to be exclusively the measurement of the field in another dimension (e.g. Y). |
| damped impulse | Diminishing over time of the amplitude of an impulse twist. |
| dark spot | Intensely shaded (black) area on a field-versus-altitude plot. |
| (day-night) terminator | Borderline between daytime and nighttime regions of the earth. In general, the position of this borderline at the surface of the earth is different from its position at the satellite altitude. |
| day-of-year, day number | Number of days since last 12/31. For January 20, the day-of-year = 20. |
| decompose | To express an effect as the sum of its contributors. For the boom experiment, decomposition was the attempt to express the affect of the boom as the sum of three constituent twists. |
| definitive early calibration | Currently accepted value of the early calibration matrices for launch through day 2000-097. |
| definitive late calibration | Currently accepted value of the early calibration matrices from day 2000-098 onward. |

| | |
|----------------------------|--|
| deg | Degrees. |
| delta ("impulse") function | A function whose value is infinite at one point and zero at all other points. This function is plotted as a straight line extending upward from the horizontal axis at this point. |
| direction of motion | The "Y"-direction, which points in the direction where a DMSP satellite is heading. Also described as the velocity axis. |
| DMSP | Defense Meteorological Satellite Program. |
| domain | Variable on the horizontal axis, over which the magnetic field is plotted on the vertical axis. The domain is usually Universal Time, but can be satellite altitude, latitude, amount of sunlight, or the Fourier transform of any of the above. |
| down | The "X"-direction, which points from a DMSP satellite towards the center of the earth. |
| early calibration matrix | A least-outlying calibration matrix for launch through Day 097-2000. |
| ephemeris | Contains position information of a satellite for specified times. |
| F12, F13, F14 | DMSP Satellites, launched before F15, whose SSM sensors are mounted on the main body of the spacecraft. |
| F15 | The DMSP satellite launched 12/12/1999, whose SSM sensor sits on a boom. |
| FFT | Fast Fourier Transform, a time-efficient algorithm that approximates the Fourier Transform of a given equation. |
| flat day | A data day with a weak or non-existent sine wave in the Z-curve. |
| FT | Fourier Transform. A time-domain function $x(t)$ converted to a frequency-domain function $X(f)$. Here the frequency "f" is proportional to $1/t$, where t = time. |
| geographic coordinates | Latitude and longitude based on the true north pole. |
| geomagnetic coordinates | Latitude and longitude based on the magnetic north pole. |
| GIF | Graphics-Interchange Format. The plots generated in this experiment are GIF files whose three-letter extension is ".GIF." |

| | |
|-------------------------|---|
| IDL | Interactive Data Language, the programming language of the plot algorithms in this experiment. |
| IGRF | International Geomagnetic Reference Field. A model of the magnetic field of the earth. This model is updated every five years. The last update, IGRF-2000, is dated January 1, 2000. |
| imaginary | A multiple of j , which is the theoretical square root of -1 . A complex number consists of two parts: real and imaginary. However, the letter "i" is usually used instead of "j". |
| impulse twist | Brief effective rotation of magnetometer around up to three axes, by an amount that is quickly damped. Simulates by a motion of the boom relative to the satellite. |
| in-flight calibration | Calibration done after the satellite is launched. In-flight calibration simply multiplies a constant three-dimensional rotation matrix by the measured field and adds a 3×1 vector. For more information, see "calibration" above. |
| in phase | Used to describe two sine waves of the same period whose peaks coincide. |
| jump | A step up-and-down discontinuity in the plotted curve of magnetic field strength. |
| kink | A sharp curve bend on a field-versus-altitude plot, conceivably due to a thermal twist in the boom. |
| late calibration matrix | A least-outlying calibration matrix from Day 098-2000 onward. |
| latitude peak | The northernmost or southernmost point in the orbit of the satellite. |
| least-squares | A mathematical technique to find a vector of values that minimize the square-norm of a given error. See also "linear least-squares." |
| linear | Additive and multiplicative. |
| linear least-squares | A least-squares equation whose solution vector is obtained by solving a system of linear equations. See also "least-squares." |
| local time | Time of day where the satellite is. |

| | |
|------------------------------|---|
| long sawtooth | One of a series of end-to-end lines on the X-curve with short breaks between them. These sawteeth run along the flow of the curve. A sawtooth error function with a longer period. For more information see "sawtooth, short sawtooth" below. |
| magnetic coordinates | Latitude and longitude based on the magnetic north pole. |
| magnetometer | A sensor that measures the strength of a magnetic field. |
| magnitude | Absolute value of a number, or straight-line length of a vector. |
| Magnitude AAVMMM | Average magnitude of the MMM field over all data points in a given day. For each data point, the MMM magnitude is the square root of $(X^2 + Y^2 + Z^2)$. Here X, Y, and Z are the three components of the MMM at this data point. |
| maximum absolute value | The highest value of field strength in NanoTesla, independent of sign (plus or minus), among a set of field strengths in a given direction (X, Y, or Z). |
| measured field | The strength of a magnetic field, according to measurement by a satellite sensor. |
| measured-minus-modeled field | Also called "MMM." The measured field minus the modeled field. Theoretically, $MMM = 0$ nT for a perfect model on a day with no magnetic activity. |
| MFR | Magnetic-Field Record of SSM measured-minus-modeled field strengths |
| MFR file | Contains MFRs. The main output of APSM. |
| MMM field | Measured-Minus-Modeled magnetic field, the error in a measured magnetic field of the earth along the track of a DMSP satellite. The MFR file contains the MMM field. |
| modeled field | The strength of a magnetic field as computed by a model, such as IGRF-2000, of the internal magnetic field of the earth. |
| multiplicative | A boom twist that when multiplied by a factor N, multiplies its effect on the resulting plot by the same factor N. |
| natural phenomena | Non man-made disturbances of the magnetic field. For example: auroras, storms, equatorial magnetism. |

| | |
|-------------------|---|
| noise | Random changes in the magnetic field. Changes and effects below the measurement/analysis threshold of the SSM/APSM. "In the noise" does not mean that it drowned out something. However, it means that we simply can not measure/analyze precisely enough to study something that is "in the noise." Conversely, if an effect can not be observed above the noise, it can not affect what we can measure/analyze. |
| nT | NanoTesla, the unit of strength of a magnetic field. |
| OFFSET | A constant 3x1 offset matrix used for calibration. For more information, see "calibration" above. |
| optimal | Used to describe a value that minimizes a given error. |
| orbit normal | The "Z"-direction, which points parallel to the direction of the orbit normal of a DMSP satellite. |
| Ørsted | A Danish satellite launched on 02/23/1999. The main goal of its mission is to accurately map the magnetic field of the earth. For more information see Section 3.6. |
| ORTHO | A constant 3x3 rotation matrix used for calibration. ORTHO can be written as the product of the three basic rotation matrices $R_A R_B R_C$. For more information, see "calibration" above and " R_A ," " R_B ," " R_C ," and "rotation matrix" below. |
| oscillation | See "twist error" below. |
| out of phase | Used to describe two sine waves of the same period whose peaks occur at different times. For example, if the peaks are 1/4 period apart, the waves are 90 degrees out of phase. See also "period." |
| peak | The top part of a curve, as opposed to its trough or valley. |
| period | Time (in seconds) between repetitions of a feature (such as a wave peak) on a plotted curve. |
| periodic function | Function whose features repeat every N seconds, where N is a positive number. Also, a function that approximately equals such a repetitive function. |
| phase | The part of a wave (peak, trough, or in between) at a given starting point in time (seconds UT). |
| phase error | See "time correction, time error." |

| | |
|--|--|
| preliminary early calibration matrices | An initial estimate of the early calibration matrices. |
| preliminary late calibration matrices | An initial estimate of the late calibration matrices. |
| preprofile | File of partially unpacked and re-ordered SSM telemetry data derived from a BC SSM data file. The input to APSM. |
| QuickSort | An algorithm that quickly sorts a set of values into a prescribed order. |
| quiet | Displaying low natural magnetic activity. Quiet periods generally have a low Kp or Ap. |
| R_A | 3x3 matrix that rotates a 3x1 vector A degrees in the YZ plane. |
| R_B | 3x3 matrix that rotates a 3x1 vector B degrees in the XZ plane. |
| R_C | 3x3 matrix that rotates a 3x1 vector C degrees in the XY plane. |
| real | A number that does not involve j, the square root of -1. A complex number consists of two parts: real and imaginary. However, the letter "i" is usually used instead of "j." |
| residual | The error, or remainder, term of a least-squares equation. This term is a vector. The residual is denoted by "R." |
| rotation matrix | 3x3 matrix $R_A R_B R_C$ that rotates a given 3x1 vector by an angle in each of the three dimensions. |
| sawtooth, short sawtooth | One of a series of parallel lines on the X-curve that appear close together and are often aligned perpendicular to the flow of the curve. A sawtooth error function with a shorter period. For more information see "long sawtooth" above. |
| shift | Difference in optimal value of time correction, or another quantity, between two periodic functions. |
| short sawtooth | See "sawtooth" above. |
| sinusoidal | Resembling a sine wave. |
| spike | A vertical offshoot from the baseline curve due to an impulse. |

| | |
|-----------------------------|--|
| square norm | Square root of the sum-of-squares of the components of a vector. |
| SSM | Special-Sensor Magnetometer. |
| sunlight | Time that the satellite spent in the sun, which depends on the position of the satellite in the day/night cycle. |
| SV, or secular variation | Change in the modeled magnetic field over time. |
| terminator | See "(day-night) terminator" above. |
| TFR | Total-Field Record of F15-measured field strengths. |
| TFR file | Contains TFRs. An optional output of APSM. |
| thermal twist | Effective rotation of the magnetometer around up to three axes, by a function with maximums where the satellite crosses the terminator from day to night. Simulates a motion of the boom relative to the satellite induced by the heat of the sun and by cooling at night. |
| time correction, time error | The amount of time, in seconds, that a magnetic-field curve needs to be shifted horizontally to overlap another curve, reducing the difference between the two curves. |
| TLE | Two-Line Element that contains the orbital elements from which position information of a satellite can be derived. The TLE ephemeris consists of ephemeris derived from daily TLEs. |
| track | Series of the positions of a satellite over time. |
| trough | The bottom part of a curve, as opposed to its peak. |
| twist error | A deviation from the baseline curve due to a (simulated) force that twists the boom. The forces studied in this experiment are the continual, thermal, and impulse twists. |
| UT | Universal Time, or number of seconds since midnight at Greenwich Mean Time. Unlike the local time, the UT is independent of the satellite location. |
| valley | A low area between two nearby peaks on a curve. |
| wavy day | A data day with a strong sine wave in the Z-curve. |

| | |
|-------------------|---|
| X-axis | A line, whose positive direction points down from a DMSP satellite towards the center of the earth. |
| X-value of AAVMMM | Average absolute value of the X-component of the MMM field over all data points in a given day. |
| XY-plane | The two-dimensional plane that contains the axes X and Y. |
| XZ-plane | The two-dimensional plane that contains the axes X and Z. |
| Y-axis | A line, whose positive direction points from a DMSP satellite in its direction of motion. |
| Y-value of AAVMMM | Average absolute value of the Y-component of the MMM field over all data points in a given day. |
| YZ-plane | The two-dimensional plane that contains the axes Y and Z. |
| Z-axis | A line, whose positive direction points from a DMSP satellite in the orbit-normal direction. |
| zero model | Derived from the IGRF-2000 magnetic-field model by setting all values of the coefficient array GT in APSM_IGRF_2000.INC to zero. The IGRF 2000 model with no correction for secular variation from the January 1, 2000 epoch. |
| Z-value of AAVMMM | Average absolute value of the Z-component of the MMM field over all data points in a given day. |
| Z-wave | A sine wave of significant amplitude in the Z-curve of some data days but not of others. |